What is claimed is:

1. A method for analyzing polysaccharide content in a test sample comprising at least one herb, the method comprising:

providing a saccharide sample comprising oligosaccharides and monosaccharides obtained by partial acid hydrolysis of polysaccharides in the test sample;

contacting the saccharide sample with 4-aminobenzoic acid ethyl ester (ABEE) or an analog thereof and a reducing agent thereby forming an ABEE labeled saccharide sample comprising one or more ABEE labeled saccharides; and

analyzing the ABEE labeled saccharide sample using at least one analytical method thereby providing test sample polysaccharide content related data.

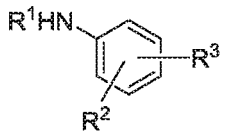
2. The method of claim 1, wherein the at least one herb is selected from the group consisting of *Dendrobium officinale*, Radix Astragali, and Radix Angelica Sinensis.

3. The method of claim 1 further comprising the step of comparing the test sample polysaccharide content related data with one or more calibration curves prepared by using the interrelation between known concentrations of the one or more ABEE labeled saccharides in standard samples; and determining the concentration of at least one polysaccharide in the test sample.

4. The method of claim 1, wherein the polysaccharide content related data is used to authenticate the quality or the identity of the at least one herb.

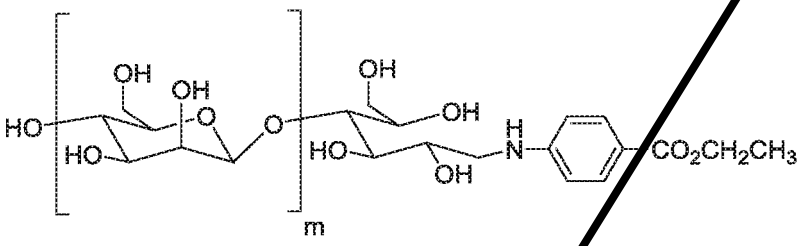
5. The method of claim 1, wherein the at least one analytical method is selected from the group consisting of high performance liquid chromatography (HPLC), liquid chromatography-mass spectrometry (LC-MS) high-performance gel permeation chromatography (HPGPC).

6. The method of claim 1, wherein the analog of ABEE has the structure:

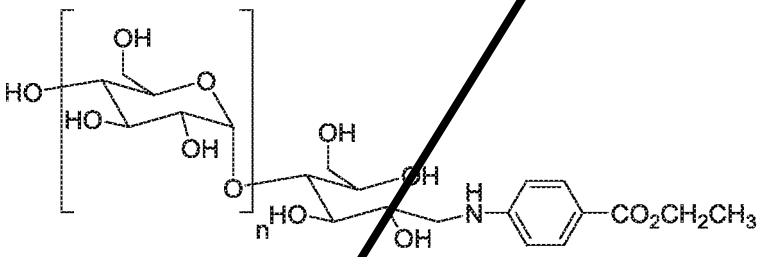


wherein R^1 is hydrogen or alkyl; R^2 is hydrogen, alkyl, cyano, alkoxyl, hydroxyl, dialkyl amine, ester, amide, urea; and R^3 is hydrogen, alkyl, cycloalkyl, heterocycloalkyl aryl, heteroaryl, amine, amide, urea, or CO_2R^4, wherein R^4 is hydrogen, alkyl, cycloalkyl, heterocycloalkyl aryl, or heteroaryl.

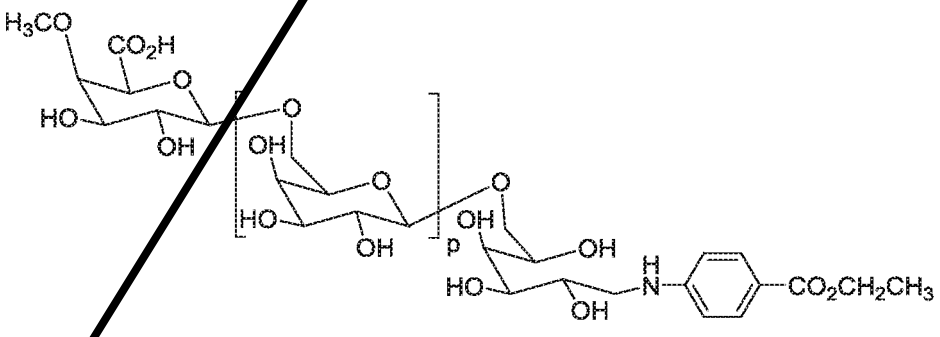
7. The method of claim 1, wherein the one or more ABEE labeled saccharides is selected from the group consisting of: ABEE labeled galacturonic acid (ABEE-GalA); ABEE labeled glucuronic acid (ABEE-GluA); ABEE labeled galactose (ABEE-Gal); ABEE labeled mannose (ABEE-Man); ABEE labeled glucose (ABEE-Glc); ABEE labeled arabinose (ABEE-Ara); ABEE labeled rhamnose (ABEE-Rha); ABEE labeled xylose (ABEE-Xyl); ABEE labeled fucose (ABEE-Fuc);



wherein m is a whole number selected from 0-10;

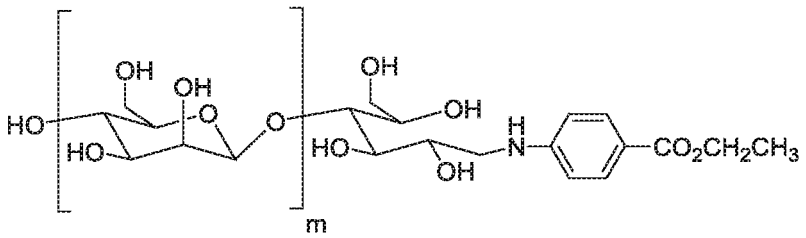


wherein n is a whole number selected from 0-10; and

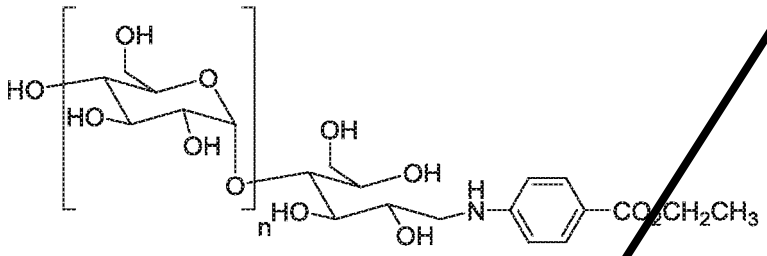


wherein p is a whole number selected from 0-10.

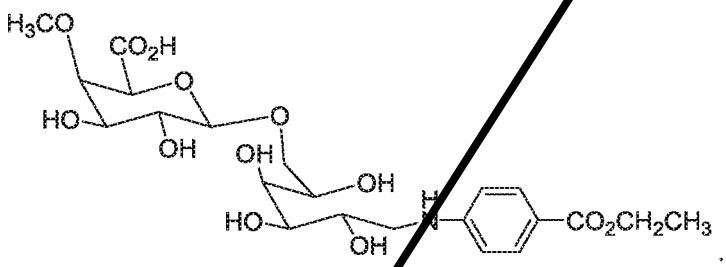
8. The method of claim 1, wherein the one or more ABEE labeled saccharides is selected from the group consisting of:



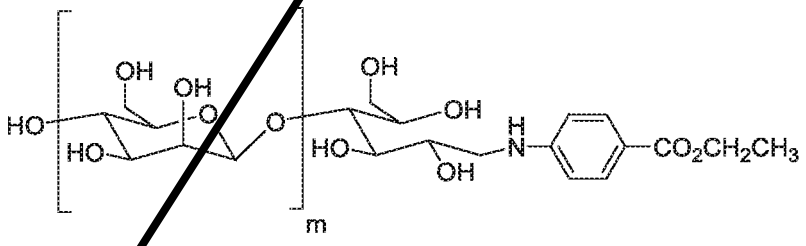
wherein m is a whole number selected from 3-9;



wherein n is 1, 2, or 7; and

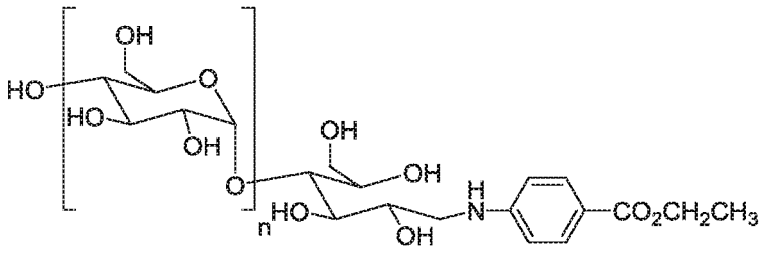


9. The method of claim 1, wherein the at least one herb is *Dendrobium officinale* and the one or more ABEE labeled saccharides is:

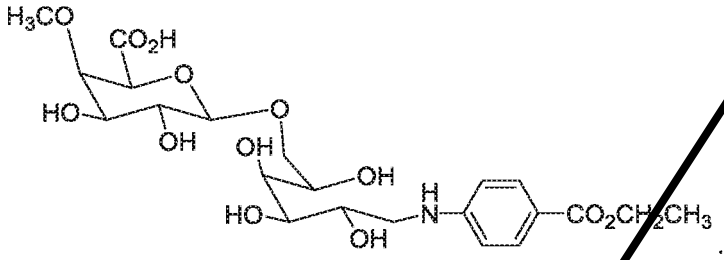


wherein m is a whole number selected from 3 or 4; or the at least one herb is selected from the group consisting of Radix Astragali, Radix Angelica Sinensis, and combinations

thereof; and the one or more ABEE labeled saccharides is selected from the group consisting of:



wherein n is 7; and



10. The method of claim 1, wherein the reducing agent is $NaBH_4$, $NaBH_3CN$, or $NaBH(OAc)_3$.

11. The method of claim 1 further comprising the step of contacting the test sample with a solvent thereby forming a polysaccharide sample.

12. The method of claim 11, wherein the solvent comprises water.

13. The method of claim 11 further comprising the step of contacting the polysaccharide sample with an acid and water thereby forming the saccharide sample.

14. The method of claim 13, wherein the acid is trifluoroacetic acid.

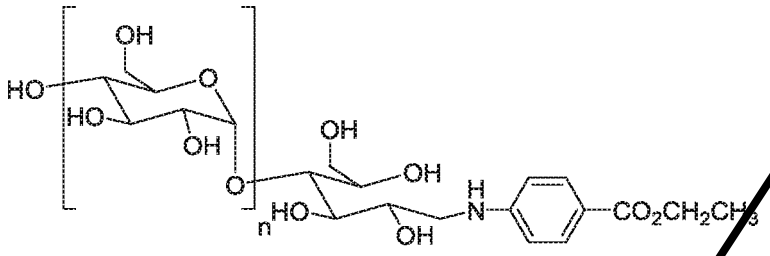
15. The method of claim 14, wherein at least 10% of the polysaccharides in the test sample are partially hydrolyzed.

16. A method for analyzing polysaccharide content in a test sample comprising at least one herb selected from the group consisting of *Dendrobium officinale*, Radix Astragali, and Radix Angelica Sinensis, the method comprising:

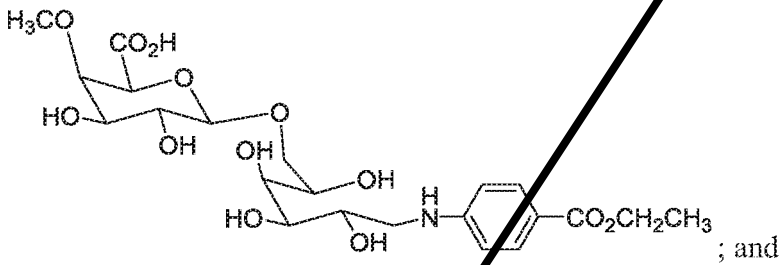
contacting the test sample with a solvent comprising water thereby forming a polysaccharide sample;

contacting the polysaccharide sample with a trifluoroacetic acid and water thereby forming a saccharide sample comprising oligosaccharides and monosaccharides;

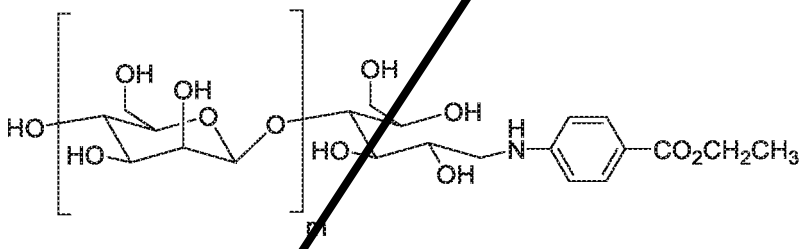
contacting the saccharide sample with 4-aminobenzoic acid ethyl ester (ABEE) and a reducing agent selected from the group consisting of $NaBH_4$ and $NaBH_3CN$ thereby forming an ABEE labeled saccharide sample comprising one or more ABEE labeled saccharides selected from the group consisting of:



wherein n is 7;



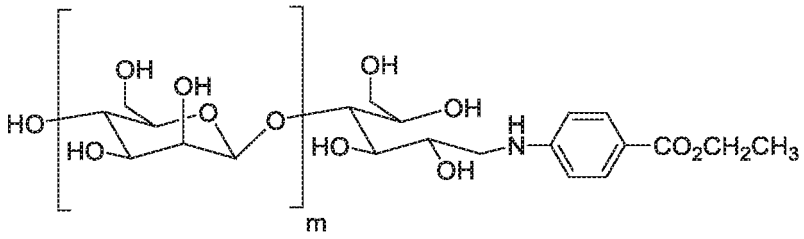
; and



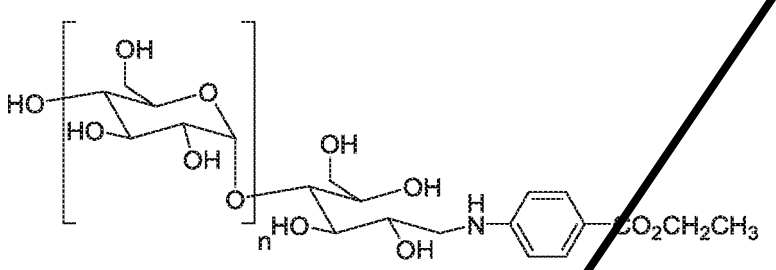
wherein m is a whole number selected from 3 or 4; and

analyzing the ABEE labeled saccharide sample using at least one analytical method selected from the group consisting of LC-MS and HPGPC thereby providing test sample polysaccharide content related data.

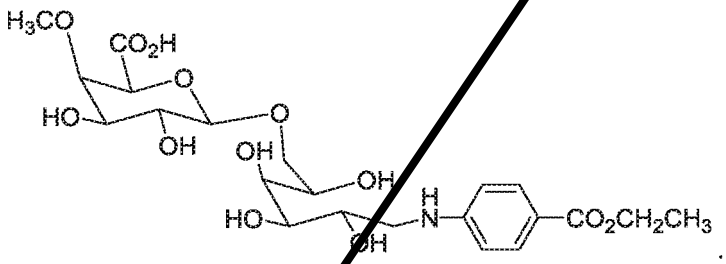
17. The method of claim 16, wherein the at least one herb is *Dendrobium officinale* and the one or more ABEE labeled saccharides is:



wherein m is a whole number selected from 3 or 4; or the at least one herb is selected from the group consisting of Radix Astragali, Radix Angelica Sinensis, and combinations thereof; and the one or more ABEE labeled saccharides is selected from the group consisting of:



wherein n is 7; and



18. The method of claim 16 further comprising the step of comparing the test sample polysaccharide content related data with one or more calibration curves prepared by using the interrelation between known concentrations of the one or more ABEE labeled saccharides in standard samples; and determining the concentration of at least one polysaccharide in the test sample.

19. The method of claim 16, wherein the polysaccharide content related data is used to authenticate the quality or the identity of the at least one herb.

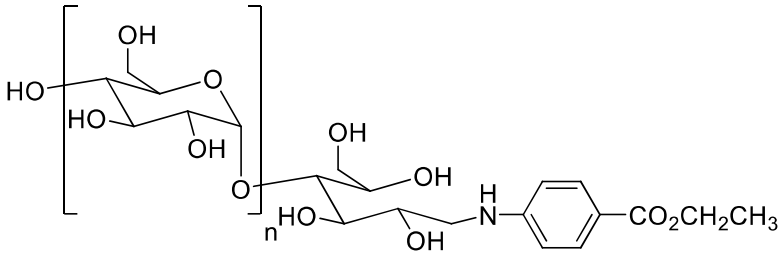
Claims

1. A method for analyzing polysaccharide content in a test sample comprising at least one herb selected from the group consisting of *Dendrobium officinale*, Radix Astragali, and Radix Angelica Sinensis, the method comprising:

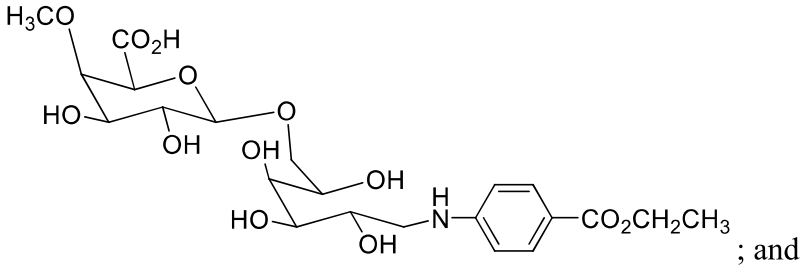
contacting the test sample with a solvent comprising water thereby forming a polysaccharide sample;

contacting the polysaccharide sample with a trifluoroacetic acid and water thereby forming a saccharide sample comprising oligosaccharides and monosaccharides;

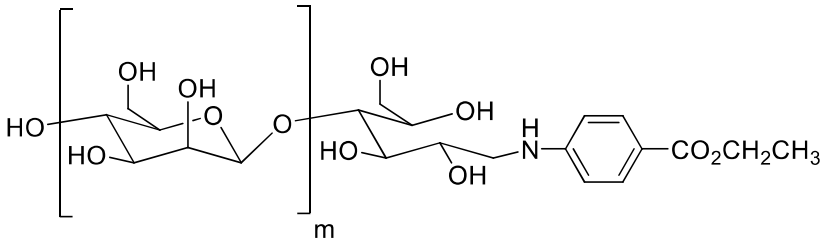
contacting the saccharide sample with 4-aminobenzoic acid ethyl ester (ABEE) and a reducing agent selected from the group consisting of $NaBH_4$ and $NaBH_3CN$ thereby forming an ABEE labeled saccharide sample comprising one or more ABEE labeled saccharides selected from the group consisting of:



wherein n is 7;



; and

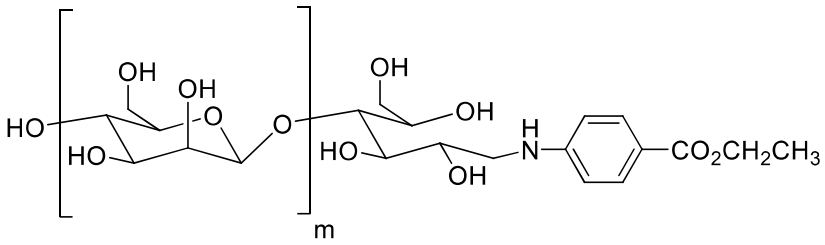


wherein m is a whole number selected from 3 or 4; and

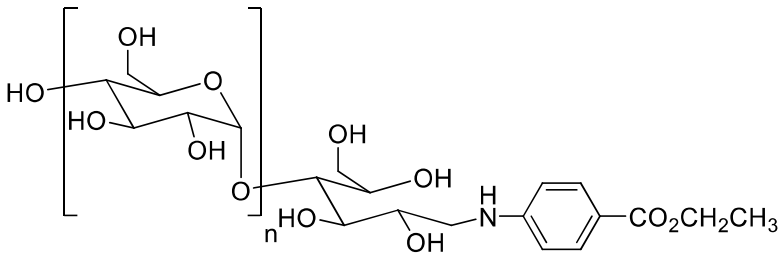
analyzing the ABEE labeled saccharide sample using at least one analytical method selected from the group consisting of liquid chromatography-mass spectrometry (LC-MS) and high-performance gel permeation chromatography (HPGPC) thereby providing test sample polysaccharide content related data.

2. The method of claim 1, wherein at least 10% of the polysaccharides in the test sample are partially hydrolyzed.

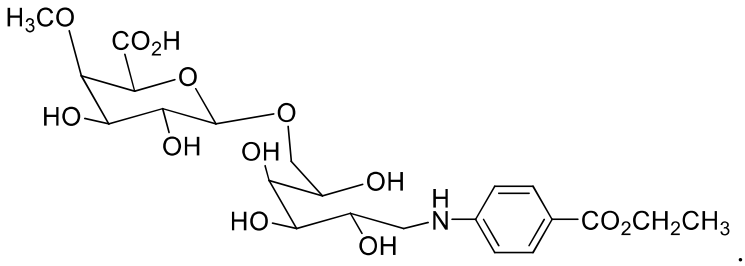
3. The method of claim 1, wherein the at least one herb is *Dendrobium officinale* and the one or more ABEE labeled saccharides is:



wherein m is a whole number selected from 3 or 4; or the at least one herb is selected from the group consisting of Radix Astragali, Radix Angelica Sinensis, and combinations thereof; and the one or more ABEE labeled saccharides is selected from the group consisting of:



wherein n is 7; and



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4. The method of claim 1 further comprising the step of comparing the test sample polysaccharide content related data with one or more calibration curves prepared by using the interrelation between known concentrations of the one or more ABEE labeled saccharides in standard samples; and determining the concentration of at least one polysaccharide in the test sample.

5. The method of claim 1, wherein the polysaccharide content related data is used to authenticate the quality or the identity of the at least one herb.