Table S1. Information of 16 investigated monosaccharides.

Monosaccharide group	Molecular formula	Molecular weight (g/mol)	Chemical structure
Glc, Man, Gal	$C_6H_{12}O_6$	180.16	CHO —OH HO— —OH —OH CH_2OH
Ara, Rib, Xyl	$C_5H_{10}O_5$	150.13	CHO —OH HO— —OH —OH H
Rha, Fuc	$C_6H_{12}O_5$	164.16	CHO —OH HO— —OH —OH CH_3
GlcA, GalA	$C_6H_{10}O_7$	194.14	CHO —OH HO— —OH —OH COOH
Fru	$C_6H_{12}O_6$	180.16	CH_2OH =O HO— —OH —OH CH_2OH
So-ol, Ma-ol	$C_6H_{14}O_6$	182.17	CH_2OH —OH HO— —OH —OH CH_2OH
Xy-ol, Ri-ol	$C_5H_{12}O_5$	152.15	CH_2OH —OH HO— —OH —OH H
GlcN	$C_6H_{13}NO_5$	179.17	OH —OH HO— —OH —NH_2 O

Table S2. Information of 5 polysaccharides.

Polysaccharides	Monosaccharide types in literature	Main glycosidic bonds	Neutral/ Acidic	Percentage composition of monosaccharides detected in this study	Reference
Inulin	Glc, Fru	(2→1)-β-D-Fru	neutral	Glc: Fru=57.4%: 42.6% (GC, One-step)	[25-27]
Pectin	Rha, Ara, Gal, Glc, GalA	(1→4)-α-D-GalA (1→2)-α-Rha (1→4)-β-D-Gal	acidic	Ara: Rha: Glc: Gal: GalA=5.0%: 2.5%: 6.4%: 4.0%: 82.1% (HPLC, Two-step)	[29-31]
LBP	Ara, Gal, GlcA, Rha, Glc, Xyl, Man	(1→4)-α-D-GalA (1→6)-α-D-Glc (1→5)-α-L-Ara (1→4)-β-D-Gal (1→6)-β-D-Gal	acidic/ neutral	Ara: Xyl: Rha: Man: Glc: Gal: GalA=15.2%: 4.3%: 7.1%: 1.2%: 4.2%: 7.1%: 60.9% (HPLC, Two-step)	[32-34]
CPP	Ara, Rha, Gal, GalA, Glc, Man	(2→1)-β-D-Fru (1→4)-α-D-GalA (1→3)-β-D-Gal (1→3, 6)-β-D-Gal (1→2)-β-D-Rha (1→4)-D-Man	acidic	Ara: Rha: Man: Glc: Gal: Fru=21.5%: 3.5%: 2.9%: 17.4%: 13.7%: 41.0% (GC, One-step) Ara: Rha: Man: Glc: Gal: GalA=8.6%: 3.3%: 1.0%: 6.7%: 6.1%: 74.4% (HPLC, Two-step)	[35-37]
GIP	Man, Glc, Gal, Xyl, Ara, Fuc	(1→3)-β-Glc (1→6)-β-Glc	neutral	Xyl: Fuc: Man: Glc: Gal =3.5%: 3.9%: 9.8%: 75.4%: 7.3% (GC, One-step)	[38-39]

Table S3. Linearity of the HPTLC method for different carbohydrates.

Carbohydrates	Regression equation	R^2	Linear range (μg/mL)
Rha	Y=35.759X+1091.3	0.9210	52.00-208.00
Xyl	Y=50.623X+4175.0	0.9457	67.75-243.92
Rib	Y=35.956X+1628.3	0.9466	51.50-185.42
Glc	Y=48.342X+3286.0	0.9337	57.25-229.00
Gal	Y=33.526X+1865.7	0.9531	50.75-203.00
GlcA	Y=64.466X+750.12	0.9925	64.50-258.00
Fuc	Y=16.482X-102.51	0.9575	57.67-230.67
Ara	Y=85.104X+256.54	0.9132	56.75-227.00
GlcN	Y=24.848X-3091.7	0.9244	138.40-346.00
GalA	Y=57.954X+75.177	0.9206	28.58-228.67
Fru	Y=12.412X+446.26	0.9236	147.20-460.00
Man	Y=27.159X-545.43	0.9105	69.00-345.00

Table S4. Linearity and accuracy of the HPLC method for different carbohydrates.

Carbohydrates	Regression equation	R^2	Linear range (µg/mL)	LOD (µg/mL)	LOQ (µg/mL)	Accuracy (%)
Man	Y=19313X-55621	0.9990	3.10-298	0.19	0.63	93.8
Rib	Y=18970X+44464	0.9994	3.15-302	0.22	0.73	93.2
Rha	Y=16503X+34800	0.9994	3.39-325	0.26	0.87	92.5
GlcN	Y=16677X-31168	0.9999	3.57-343	0.38	1.27	101.3
GlcA	Y=16956X-109712	0.9954	3.32-319	0.36	1.21	95.6
GalA	Y=17497X-97533	0.9970	3.30-317	0.42	1.39	92.3
Glc	Y=17196X-44275	0.9977	3.15-302	0.41	1.36	91.9
Gal	Y=20272X-90571	0.9928	3.09-297	0.28	0.92	90.9
Xyl	Y=21645X+52498	0.9996	3.25-312	0.23	0.76	92.8
Ara	Y=23664X-64558	0.9980	3.18-305	0.24	0.81	90.6
Fuc	Y=11696X+29253	0.9971	3.04-292	0.39	1.29	91.1

Table S5. Precision for HPLC method.

Carbohydrates	Low concentration/(25 µg/mL)				Medium concentration/(50 µg/mL)				High concentration/(100 µg/mL)			
	Peak area (% RSD)		Retention time (% RSD)		Peak area (% RSD)		Retention time (% RSD)		Peak area (% RSD)		Retention time (% RSD)	
	intraday (n=6)	interday (n=6)	intraday (n=6)	interday (n=6)	intraday (n=6)	interday (n=6)	intraday (n=6)	interday (n=6)	intraday (n=6)	interday (n=6)	intraday (n=6)	interday (n=6)
Man	0.81	2.17	0.25	0.46	0.60	2.56	0.42	0.46	0.89	3.78	0.25	0.55
Rib	0.63	2.10	0.42	0.55	0.23	4.06	0.50	0.66	0.61	2.10	0.27	0.61
Rha	1.15	2.61	0.58	0.57	0.29	6.16	0.43	0.74	0.68	6.97	0.22	0.71
GlcN	1.66	3.33	0.36	0.25	0.59	3.50	0.42	0.33	1.07	2.75	0.31	0.37
GlcA	2.06	6.80	0.60	0.58	1.09	6.44	0.63	0.62	0.78	4.14	0.37	0.66
GalA	2.92	6.01	0.51	0.61	1.46	6.06	0.48	0.61	0.67	5.69	0.47	0.72
Glc	1.32	8.64	0.23	0.40	3.71	4.86	0.42	0.53	1.59	6.08	0.31	0.65
Gal	1.50	5.02	0.20	0.31	0.10	8.50	0.24	0.27	0.65	5.58	0.22	0.37
Xyl	1.60	3.77	0.18	0.25	0.62	6.47	0.20	0.25	1.68	5.20	0.17	0.26
Ara	3.29	8.33	0.28	0.18	0.73	7.08	0.25	0.21	0.93	3.98	0.22	0.24
Fuc	3.40	12.11	0.17	0.33	1.18	13.83	0.16	0.32	1.43	13.04	0.17	0.31

Table S6. Linearity and accuracy of the GC-MS method for different carbohydrates.

Carbohydrates	Regression equation	R^2	Linear range (µg/mL)	LOD (µg/mL)	LOQ (µg/mL)	Accuracy (%)
Rib	Y=0.0038X-0.0154	0.9967	3.36-215.33	0.58	1.93	84.4
Ara	Y=0.0034X-0.0105	0.9980	3.19-204.00	0.34	1.13	88.2
Xyl	Y=0.0041X-0.0141	0.9978	3.51-224.67	0.12	0.41	86.3
Ri-ol	Y=0.0083X-0.0319	0.9982	3.21-205.33	0.33	1.10	92.6
Xy-ol	Y=0.0083X-0.0355	0.9980	3.35-214.67	0.23	0.77	89.9
Ma-ol	Y=0.0070X-0.0290	0.9989	3.23-206.67	0.30	1.00	95.9
So-ol	Y=0.0070X-0.0281	0.9989	3.32-212.67	0.80	2.68	94.1
Rha	Y=0.0037X-0.0124	0.9977	3.14-200.67	0.26	0.86	88.9
Fuc	Y=0.0024X-0.0072	0.9985	3.25-208.00	0.14	0.47	99.9
Man	Y=0.0038X-0.0175	0.9983	3.54-226.67	0.27	0.90	95.3
Glc	Y=0.0044X-0.0220	0.9980	3.49-222.33	0.19	0.62	92.8
Gal	Y=0.0037X-0.0173	0.9979	3.28-210.00	0.25	0.85	92.9
Fru	Y=0.0019X-0.0004	0.9995	3.36-107.67	0.31	1.02	97.3

Table S7. Precision for GC-MS method.

Carbohydrates	Low concentration/(25 µg/mL)				Medium concentration/(50 µg/mL)				High concentration/(100 µg/mL)			
	Peak area (% RSD)		Retention time (% RSD)		Peak area (% RSD)		Retention time (% RSD)		Reak area (% RSD)		Retention time (% RSD)	
	intraday	interday	intraday	interday	intraday	interday	intraday	interday	intraday	interday	intraday	interday
	(n=6)	(n=6)	(n=6)	(n=6)	(n=6)	(n=6)	(n=6)	(n=6)	(n=6)	(n=6)	(n=6)	(n=6)
Rib	2.04	4.45	0.03	0.20	5.65	4.20	0.07	0.07	2.81	5.00	0.03	0.07
Ara	2.66	4.86	0.03	0.15	5.56	3.80	0.08	0.06	2.74	4.47	0.04	0.07
Xyl	1.73	4.36	0.02	0.14	5.78	4.06	0.07	0.05	2.51	3.61	0.03	0.08
Ri-ol	1.19	1.89	0.03	0.10	4.25	2.21	0.09	0.05	1.02	2.43	0.03	0.07
Xy-ol	1.83	2.14	0.02	0.09	3.63	2.02	0.09	0.05	0.67	2.21	0.02	0.07
Ma-ol	3.36	4.23	0.01	0.03	3.25	4.80	0.03	0.02	1.17	1.44	0.02	0.03
So-ol	4.49	5.11	0.01	0.03	2.86	4.14	0.03	0.01	1.08	2.50	0.02	0.04
Rha	2.66	5.16	0.03	0.18	5.51	3.89	0.08	0.05	2.78	6.07	0.03	0.06
Fuc	2.64	5.72	0.03	0.13	4.99	3.53	0.08	0.05	2.77	6.33	0.03	0.07
Man	3.02	4.67	0.02	0.07	4.71	3.66	0.08	0.03	2.33	2.87	0.03	0.05
Glc	3.11	4.81	0.02	0.07	4.04	3.69	0.07	0.02	2.13	1.87	0.02	0.04
Gal	2.24	4.01	0.02	0.05	3.40	3.37	0.06	0.02	2.51	3.04	0.02	0.04
Fru	1.37	3.24	0.02	0.04	0.87	0.87	0.04	0.04	3.60	4.63	0.01	0.03