

Supplementary Information

Comprehensive profiling of phenolic compounds and triterpenoid saponins from *Acanthopanax senticosus* and their antioxidant, α -glucosidase inhibitory activities

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Affiliations

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Supplementary Table S1. Optimized MRM condition in positive mode for 28 standards

Supplementary Table S2. Regression equation, linear range, coefficient of determination LOD and LOQ, and intra- and inter-day precision of 32 standard compounds

Supplementary Fig. S1 UPLC chromatograms of 37 standards. A) phenolic acid standards 15 mixture. B) flavonoid standards 10 mixture. C) saponin standards 12 mixture. P1, 1-*O*-caffeoylquinic acid; P2, neochlorogenic acid; P3, chlorogenic acid; P4, cryptochlorogenic acid; CA, caffeic acid; 1,3diCQA, cynarin; P9, 5-*O*-feruloylquinic acid; *p*CoA, *p*-coumaric acid; P13, chlorogenic acid methyl ester; FA, ferulic acid; P14, 1,4-di-*O*-caffeoylquinic acid; P15, isochlorogenic acid C; P16, 1,5-di-*O*-caffeoylquinic acid; P17, isochlorogenic acid A; P21, isochlorogenic acid B; F6, rutin; F7, hyperoside; F8, quercetin 3-*O*-glucuronide; F9, isoquercitrin; F12, guaijaverin; F14, quercetin 3-*O*-(6-*O*-malonyl)glucoside; F15, nicotiflorin; Q3Ara(f), avicularin; F16, astragalin; F19, quercitrin; CF, cauloside F; HC, hederacoside C; S22, cauloside D; DB, dipsacoside B; ASVI, asperosaponin VI; S39, ciwujianoside B; S46, ciwujianoside A₁; S57, hederasaponin B; S59, acanthopanaxoside B; S64, ciwujianoside C₃; S73, α -hederin; S80, calenduloside E.

Supplementary Fig. S2 UPLC chromatograms of 132 compounds from *Acanthopanax senticosus* A) shoots, B) leaves, C) fruits, and D) stems.

Supplementary Fig. S3 (+) ESI-MS spectra of phenolic acids.

Supplementary Fig. S4 (-) ESI-MS/MS spectra of phenolic acids acquired in IDA mode.

Supplementary Fig. S5 Proposed fragmentation patterns of 3-*O*-malonyl-1,5-di-*O*-caffeoylquinic acid.

Supplementary Fig. S6 (+) ESI-MS spectra of flavonoids

Supplementary Fig. S7. (+) ESI-MS spectra of triterpenoid saponins.

Supplementary Fig. S8 The shoots, leaves, fruits, and stems of *Acanthopanax senticosus*.

Table S1. Optimized MRM condition in positive mode for 28 standards

Parameters	Transition	DP (volt)	CE (volt)
1CQA	355.0 → 135.0	76	51
3CQA	355.0 → 163.0	56	29
5CQA	355.0 → 135.0	76	55
4CQA	355.0 → 145.0	52	45
5CQA ME	369.0 → 135.0	64	55
5FQA	369.0 → 145.0	70	45
1,4diCQA	517.0 → 517.1	81	9
3,4diCQA	517.0 → 517.1	76	9
1,5diCQA	517.0 → 517.1	76	9
3,5diCQA	517.0 → 135.0	73	71
4,5diCQA	517.0 → 135.0	71	71
Q3Rut	611.0 → 611.1	20	11
Q3Gal	465.0 → 153.0	64	69
Q3Gluc	479.0 → 229.0	66	67
Q3Glu	465.0 → 465.0	71	9
Q3Ara	435.0 → 153.0	61	65
Q3(6Mal)Glu	551.0 → 127.0	81	37
K3Rut	595.0 → 595.1	20	11
K3Glu	449.0 → 153.0	57	69
Q3Rham	449.0 → 129.0	57	23
Cauloside D	1075.3 → 1075.5	116	11
Ciwujianoside B	1206.5 → 441.1	149	37
Ciwujianoside A ₁	1238.5 → 1238.6	161	21
Hederasaponin B	1222.5 → 439.2	146	49
Acanthopanaxoside B	1280.5 → 1280.6	151	19
Ciwujianoside C ₃	1076.4 → 439.2	129	43
α -hederin	751.3 → 455.3	101	11
Calenduloside E	650.2 → 633.4	106	15

Table S2. Regression equation, linear range, coefficient of determination LOD and LOQ, intra- and inter-day precision of 32 standard compounds

Compounds	Calibration Curve ^a	R ²	Linear Range (μg/mL)	LOD (μg/mL)	LOQ (μg/mL)	RSD (%)	
						Intra-day (n =3)	Inter-day (n =3)
<i>UPLC-Triple Q-MS/MS MRM analysis for targeted compounds quantification</i>							
1CQA	$y = 28958.75\ x + 1075.952$	0.99996	0.1-10	0.04	0.13	0.35	0.50
3CQA	$y = 2123583\ x + 84155.11$	0.99974	0.05-10	0.02	0.07	1.78	3.41
5CQA	$y = 260893.7\ x + 10188.17$	0.99949	0.05-10	0.02	0.05	0.13	0.88
4CQA	$y = 723846.9\ x + 36084.77$	0.99945	0.05-10	0.01	0.03	0.33	1.57
5CQA ME	$y = 1382176\ x + 37626.27$	0.99995	0.05-10	0.01	0.03	0.91	1.76
5FQA	$y = 1581130\ x + 57824.17$	0.99953	0.05-10	0.01	0.02	0.19	1.02
1,4diCQA	$y = 290693.6\ x + 7226.979$	0.99993	0.05-10	0.01	0.02	0.28	1.30
3,4diCQA	$y = 402289.6\ x - 8347.094$	0.99978	0.05-10	0.01	0.04	0.24	1.76
1,5diCQA	$y = 317324.9\ x + 4428.527$	0.99978	0.05-10	0.03	0.09	0.68	1.39
3,5diCQA	$y = 359660.8\ x + 2144.633$	0.99977	0.05-10	0.12	0.35	0.73	0.80
4,5diCQA	$y = 380932.2\ x - 4100.144$	0.99980	0.05-10	0.07	0.21	0.39	1.24

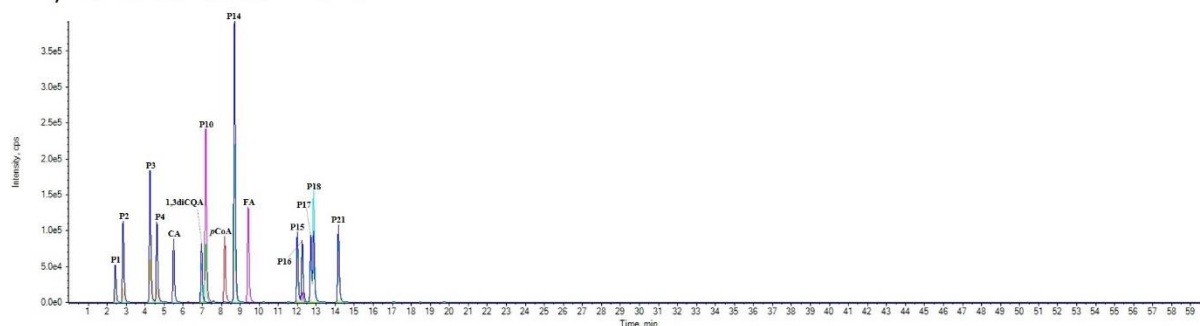
Q3Rut	$y = 2023062 x + 18107.14$	0.99971	0.05-10	0.01	0.03	0.43	0.71
Q3Gal	$y = 245889.1 x - 1299.478$	0.99989	0.05-10	0.01	0.03	0.34	1.66
Q3Gluc	$y = 214196.9 x - 6151.910$	0.99980	0.05-10	0.02	0.05	1.08	1.21
Q3Glu	$y = 2646803 x + 37189.37$	0.99961	0.05-10	0.04	0.12	0.33	0.74
Q3Ara	$y = 323809.3 x - 16291.06$	0.99972	0.05-10	0.03	0.10	0.84	1.11
Q3(6Mal)Glu	$y = 119300.4 x + 2852.487$	0.99993	0.1-5	0.04	0.12	1.07	1.33
K3Rut	$y = 2452443 x + 62038.42$	0.99994	0.05-10	0.01	0.03	0.57	0.95
K3Glu	$y = 465035.7 x + 13209.30$	0.99994	0.05-10	0.01	0.03	0.81	1.02
Q3Rham	$y = 318934.4 x + 2585.448$	0.99998	0.05-10	0.01	0.02	0.32	0.46
Cauloside D	$y = 23701.60 x - 664.8991$	0.99997	0.1-10	0.13	0.38	4.72	4.85
Ciwujianoside B	$y = 5618.569 x - 1362.723$	0.99964	0.5-25	0.09	0.27	0.22	0.88
Ciwujianoside A ₁	$y = 61816.38 x - 2201.967$	0.99975	0.5-25	0.10	0.20	4.82	5.16
Hederasaponin B	$y = 20937.54 x - 1726.401$	0.99973	0.5-25	0.09	0.26	2.35	3.03
Acanthopanaxoside B	$y = 57154.82 x - 26880.97$	0.99953	0.5-25	0.17	0.52	3.97	4.00
Ciwujianoside C ₃	$y = 152038.0 x - 11817.80$	0.99998	0.5-25	0.07	0.22	1.33	1.82
α -hederin	$y = 10732.30 x + 1639.170$	0.99940	0.1-10	0.13	0.39	2.20	2.23
Calenduloside E	$y = 1457.293 x + 1263.165$	0.99991	0.5-10	0.07	0.20	3.70	4.95

UPLC-QToF-MS analysis for untargeted compounds relative quantification

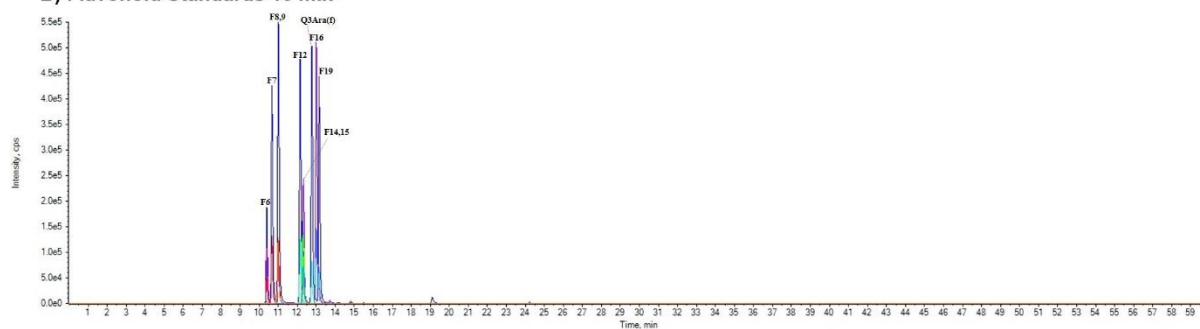
1,3diCQA	$y = 47676.96 x + 1263.165$	0.99978	0.05-10	0.12	0.36	0.19	0.49
Q3Rut	$y = 91515.03 x + 1972.455$	0.99970	0.05-10	0.01	0.03	0.85	1.64
Q3Ara(f)	$y = 283102.7 x + 4076.632$	0.99952	0.05-10	0.01	0.03	0.19	1.52
Dipsacoside B	$y = 35485.25 x + 5160.216$	0.99960	0.1-50	0.02	0.05	1.76	2.26
Asperosaponin VI	$y = 62862.88 x + 1258.051$	0.99998	0.1-10	0.01	0.02	0.72	1.09
α -hederin	$y = 84176.51 x + 9447.974$	0.99952	0.1-10	0.01	0.04	0.23	0.68

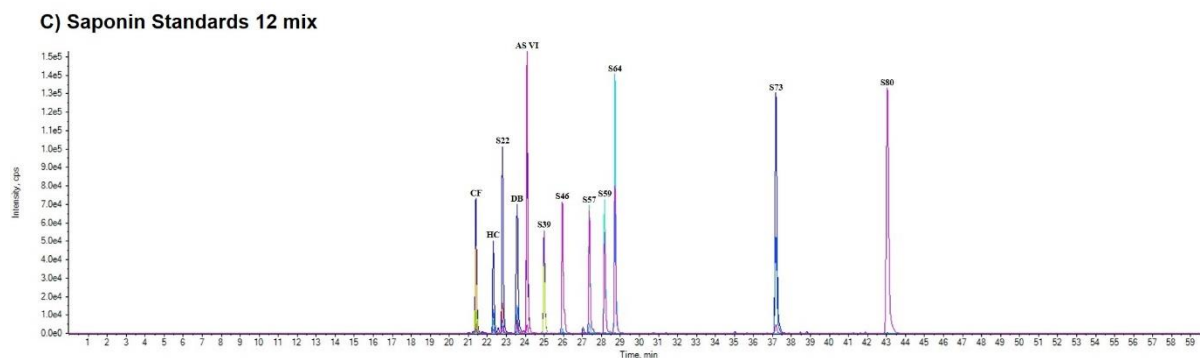
^a y, peak area; x, concentration, ppm.

A) Phenolic acid Standards 15 mix

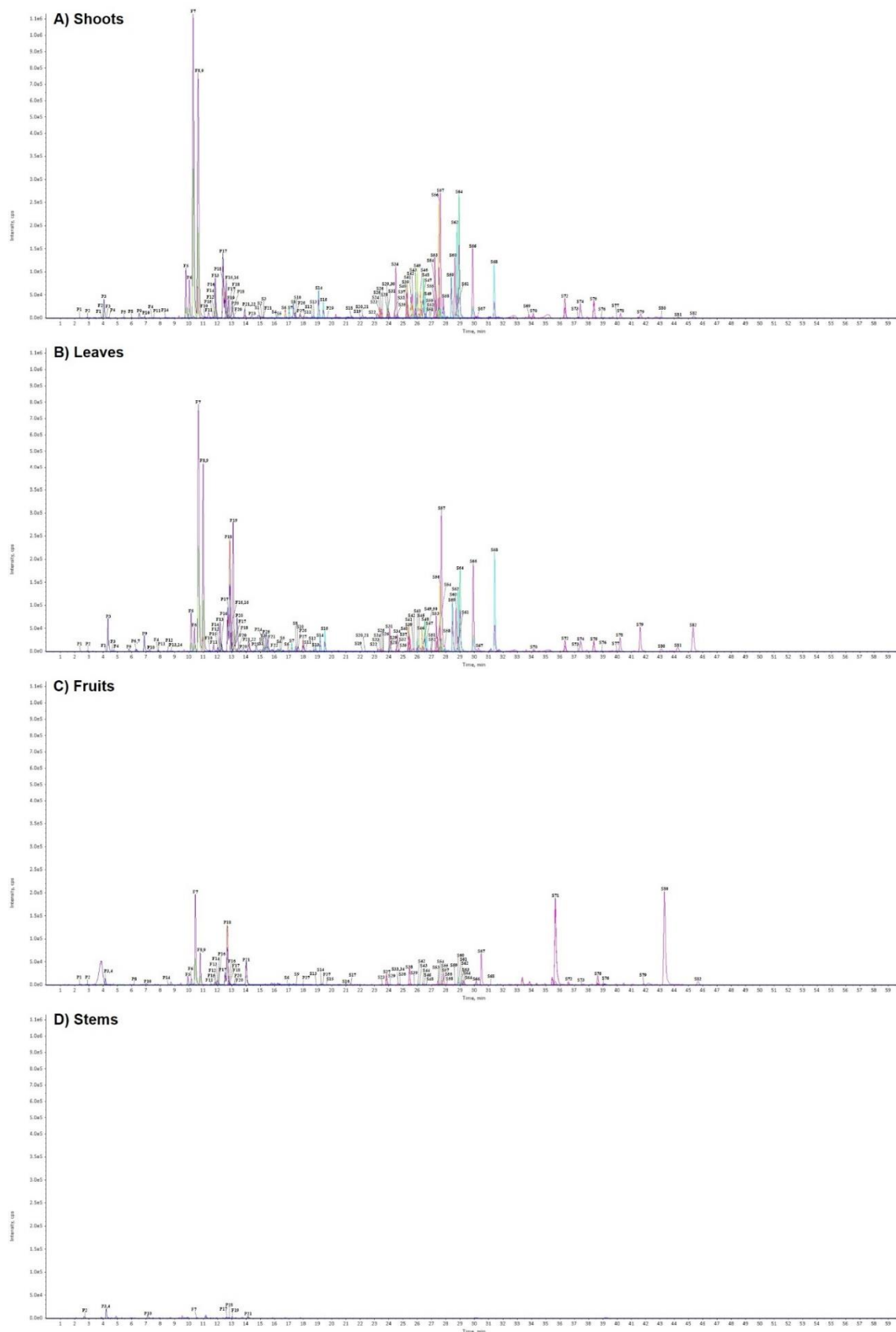


B) Flavonoid Standards 10 mix



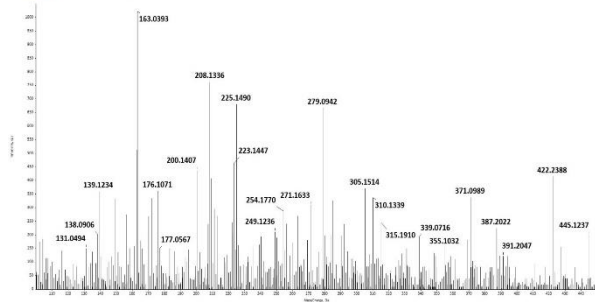


Supplementary Fig. S1 UPLC chromatograms of 37 standards. A) phenolic acid standards 15 mixture. B) flavonoid standards 10 mixture. C) saponin standards 12 mixture. P1, 1-*O*-caffeoylquinic acid; P2, neochlorogenic acid; P3, chlorogenic acid; P4, cryptochlorogenic acid; CA, caffeic acid; 1,3diCQA, cynarin; P9, 5-*O*-feruloylquinic acid; *p*CoA, *p*-coumaric acid; P13, chlorogenic acid methyl ester; FA, ferulic acid; P14, 1,4-di-*O*-caffeoylquinic acid; P15, isochlorogenic acid C; P16, 1,5-di-*O*-caffeoylquinic acid; P17, isochlorogenic acid A; P21, isochlorogenic acid B; F6, rutin; F7, hyperoside; F8, quercetin 3-*O*-glucuronide; F9, isoquercitrin; F12, guaijaverin; F14, quercetin 3-*O*-(6-*O*-malonyl)glucoside; F15, nicotiflorin; Q3Ara(f), avicularin; F16, astragalin; F19, quercitrin; CF, cauloside F; HC, hederacoside C; S22, cauloside D; DB, dipsacoside B; ASVI, asperosaponin VI; S39, ciwujianoside B; S46, ciwujianoside A₁; S57, hederasaponin B; S59, acanthopanaxoside B; S64, ciwujianoside C₃; S73, α -hederin; S80, calenduloside E.

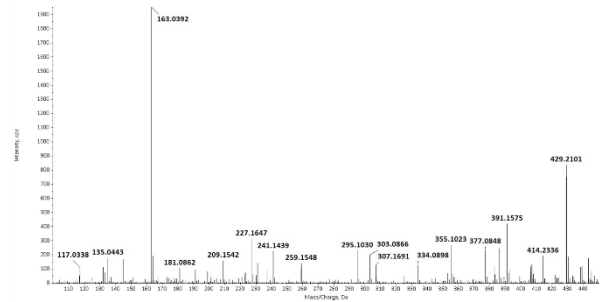


Supplementary Fig. S2 UPLC chromatograms of 132 compounds from *Acanthopanax senticosus* A) shoots, B) leaves, C) fruits, and D) stems.

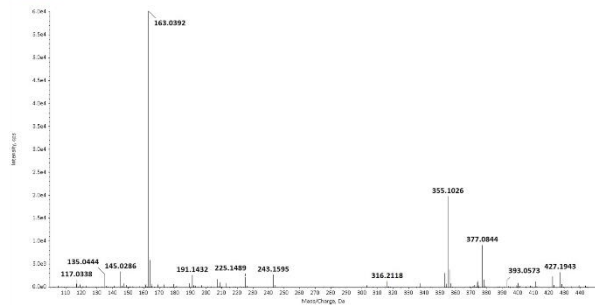
Peak P1. 1-O-caffeoylquinic acid



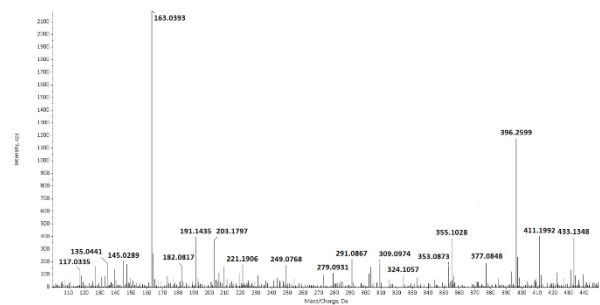
Peak P2. 3-O-caffeoylquinic acid (neochlorogenic acid)



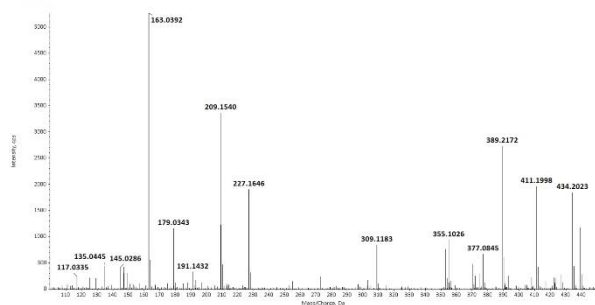
Peak P3. 5-O-caffeoylquinic acid (chlorogenic acid)



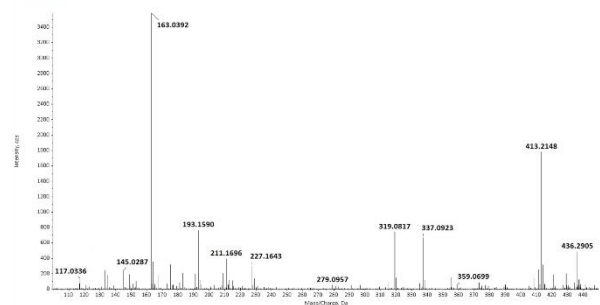
Peak P4. 4-O-caffeoylquinic acid (cryptochlorogenic acid)



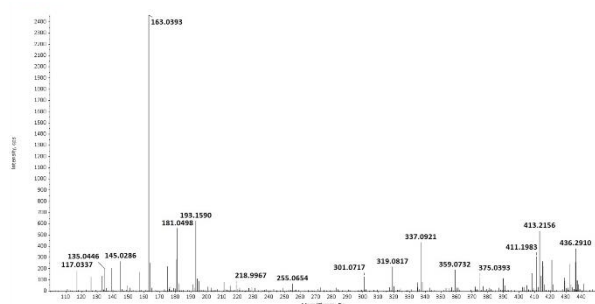
Peak P5. 5-O-*cis*-caffeoylquinic acid



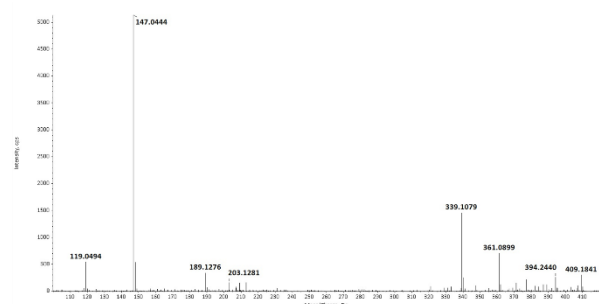
Peak P6. 4-O-caffeoylshikimic acid



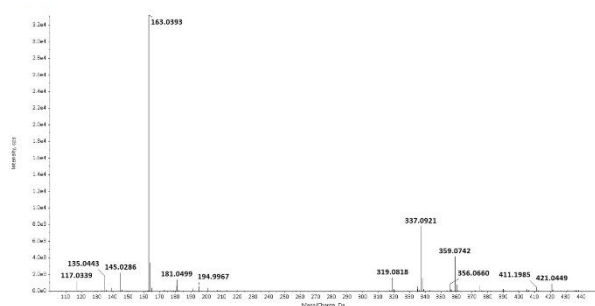
Peak P7. 5-O-caffeoylshikimic acid



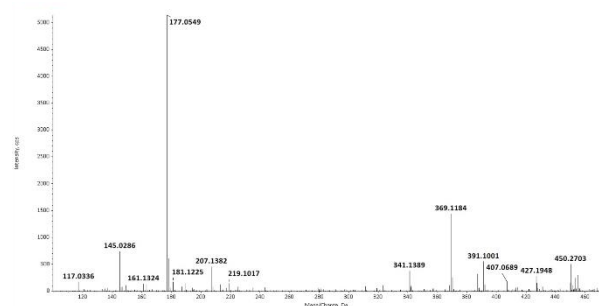
Peak P8. 5-O-*p*-coumaroylquinic acid



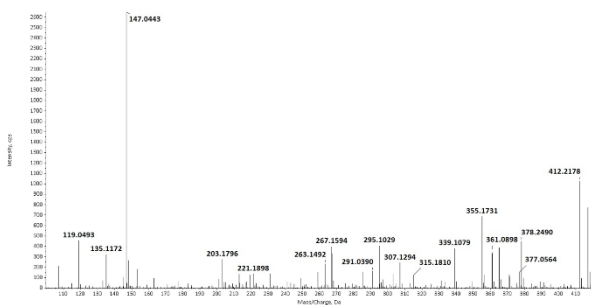
Peak P9. 3-O-caffeoylshikimic acid



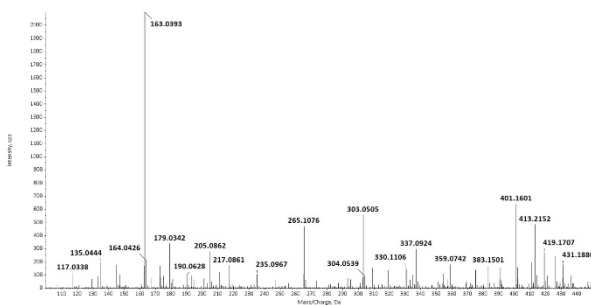
Peak P10. 5-O-feruloylquinic acid



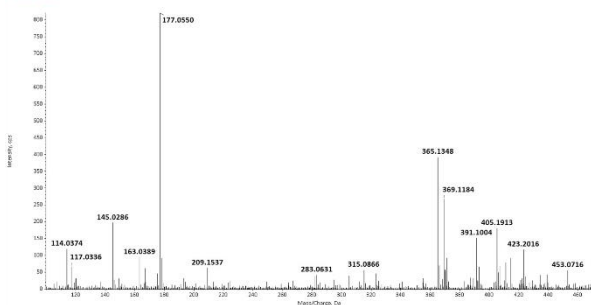
Peak P11. 5-O-*cis*-*p*-coumaroylquinic acid



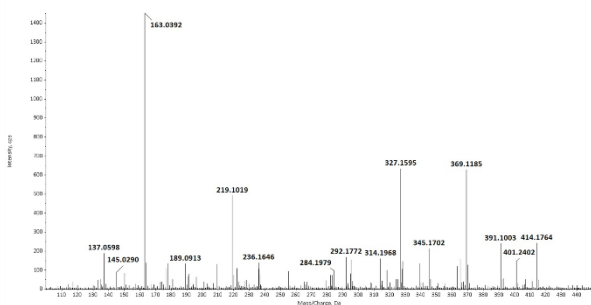
Peak P12. 3-O-*cis*-caffeoylshikimic acid



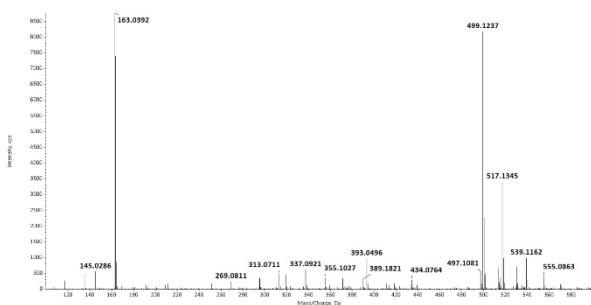
Peak P13. 5-O-*cis*-feruloylquinic acid



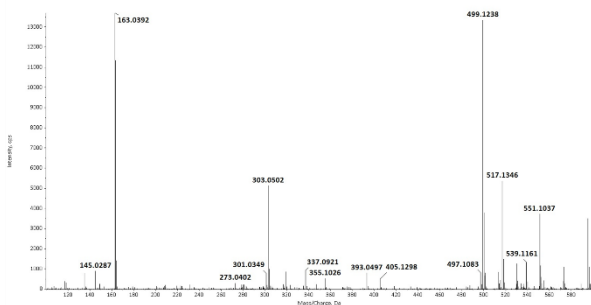
Peak P14. 5-O-caffeoylquinic acid methyl ester (chlorogenic acid methyl ester)



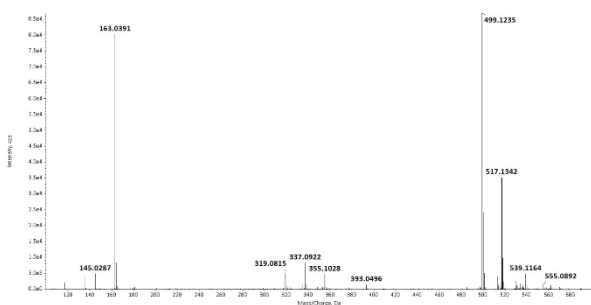
Peak P15. 1,4-di-O-caffeoylquinic acid



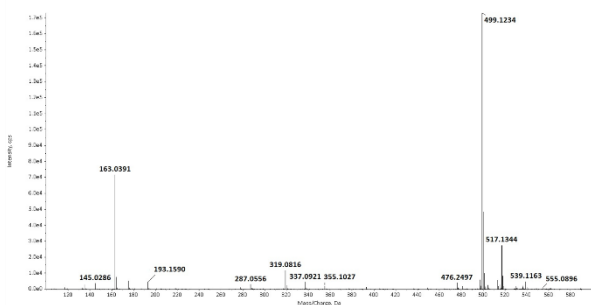
Peak P16. 3,4-di-O-caffeoylquinic acid (isochlorogenic acid C)



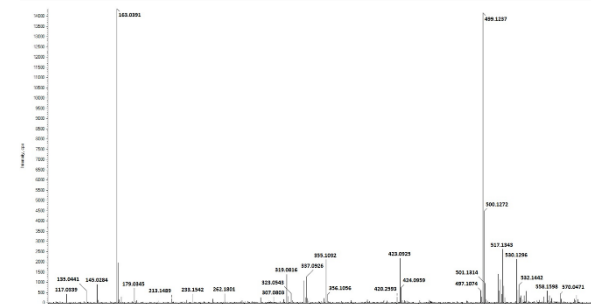
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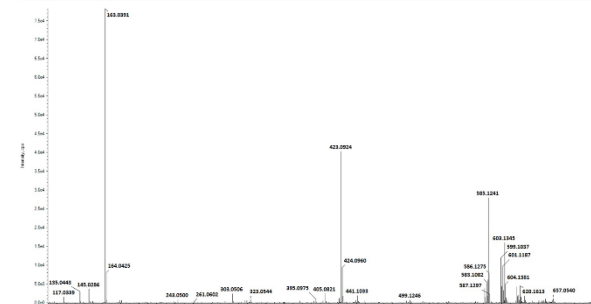
Peak P18. 3,5-di-O-caffeoylquinic acid (isochlorogenic acid A)



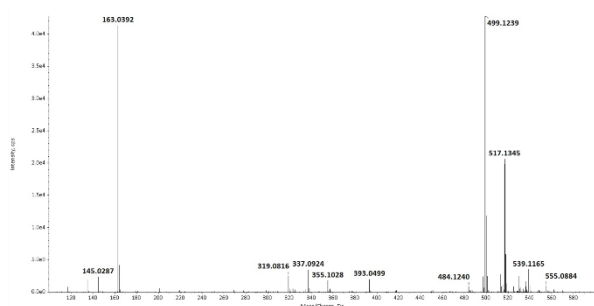
Peak P19. 3-O-*cis*-caffeoyl-5-O-caffeoylquinic acid



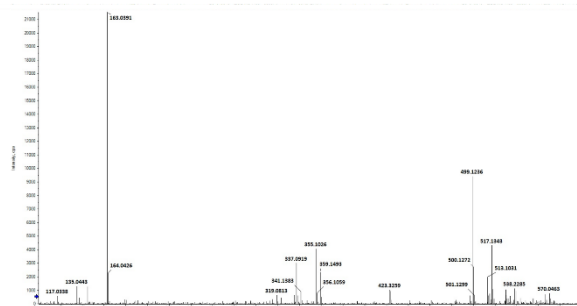
Peak P20. 3-O-malonyl-1,5-di-O-caffeoylquinic acid



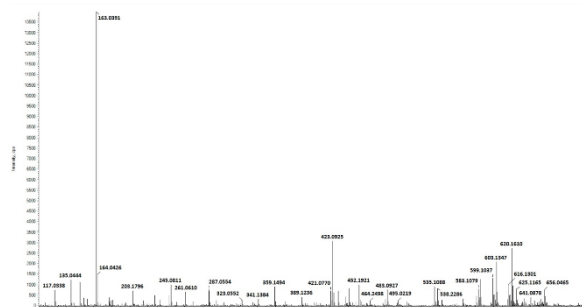
Peak P21. 4,5-di-O-caffeoylquinic acid (isochlorogenic acid B)



Peak P22. 1-O-caffeoyl-5-O-cis-caffeoylquinic acid

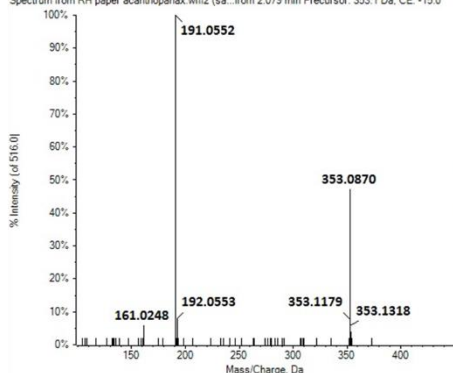


Peak P23. 3-O-malonyl-1-O-caffeoyl-5-O-cis-caffeoylquinic acid

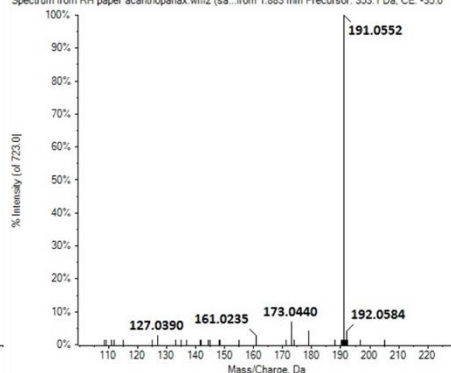


Peak P1. 1-O-caffeoylquinic acid

Spectrum from RH paper acanthopanax.wiff2 (sa...from 2.079 min Precursor: 353.1 Da, CE: -15.0

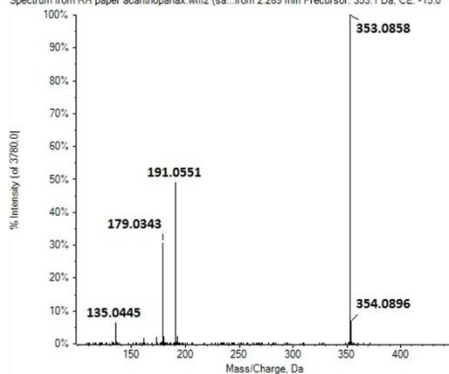


Spectrum from RH paper acanthopanax.wiff2 (sa...from 1.883 min Precursor: 353.1 Da, CE: -35.0

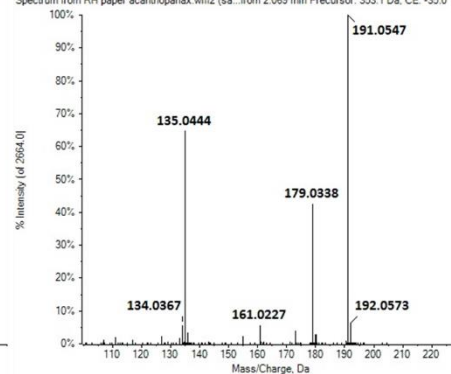


Peak P2. 3-O-caffeoylquinic acid (neochlorogenic acid)

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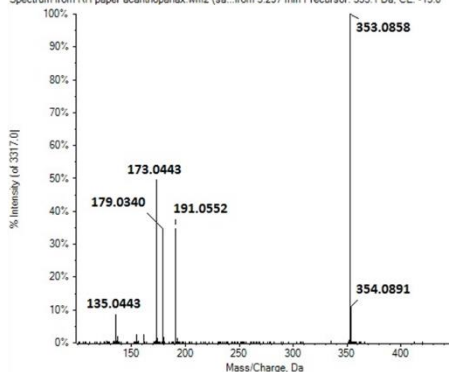


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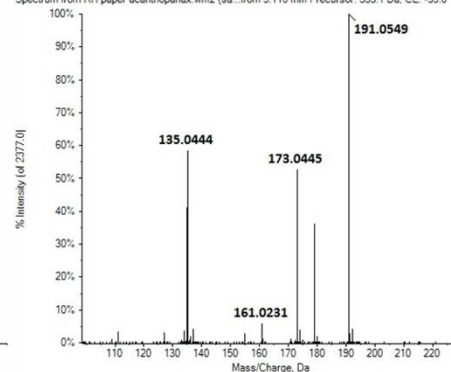


Peak P4. 4-O-caffeoylquinic acid (cryptochlorogenic acid)

Spectrum from RH paper acanthopanax.wiff2 (sa...from 3.297 min Precursor: 353.1 Da, CE: -15.0

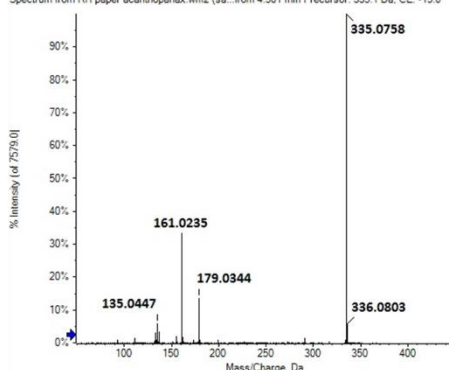


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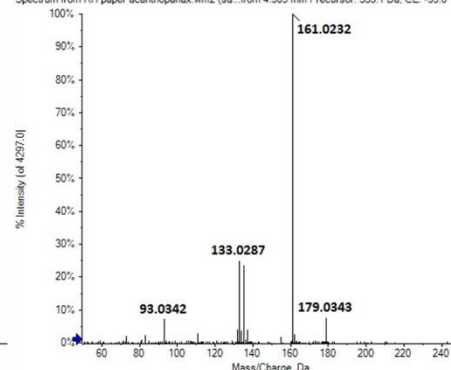


Peak P6. 4-O-caffeoylshikimic acid

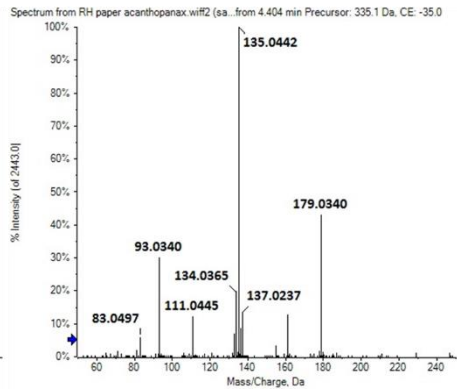
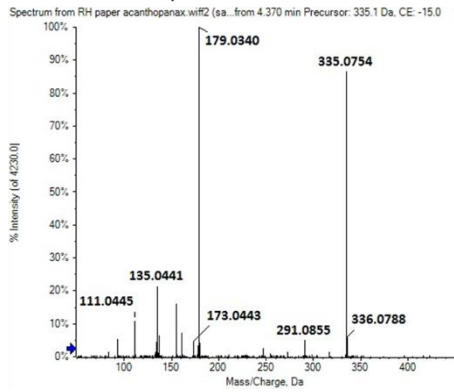
Spectrum from RH paper acanthopanax.wiff2 (sa...from 4.301 min Precursor: 335.1 Da, CE: -15.0



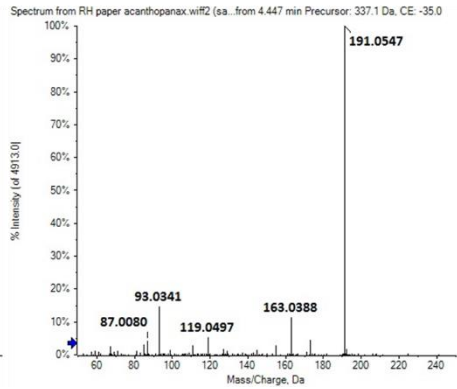
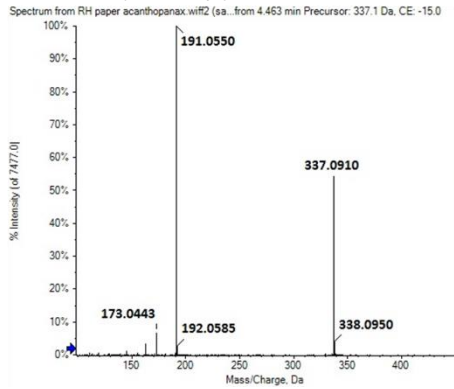
Spectrum from RH paper acanthopanax.wiff2 (sa...from 4.305 min Precursor: 335.1 Da, CE: -35.0



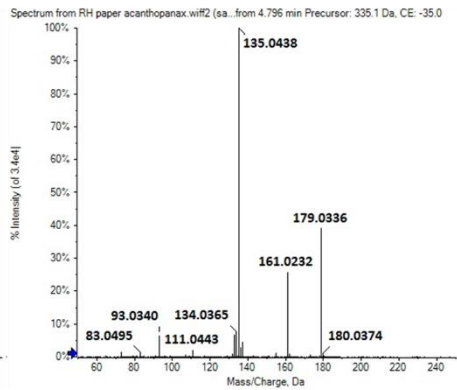
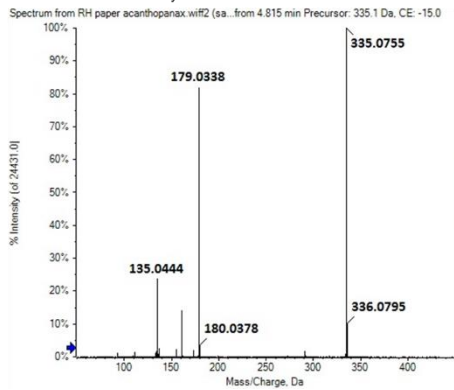
Peak P7. 5-O-caffeoylshikimic acid



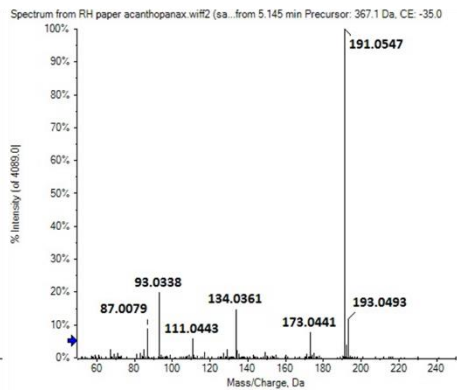
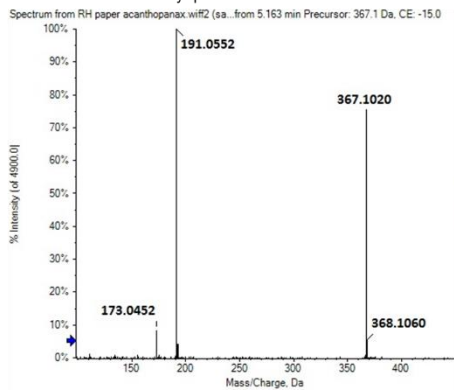
Peak P8. 5-O-p-coumaroylquinic acid



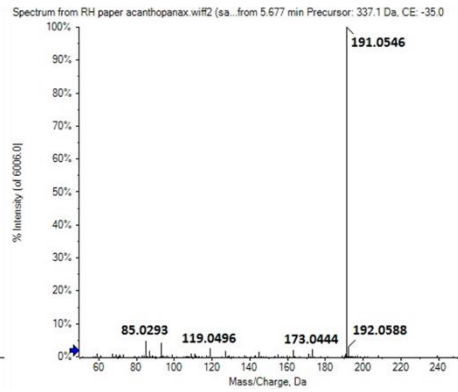
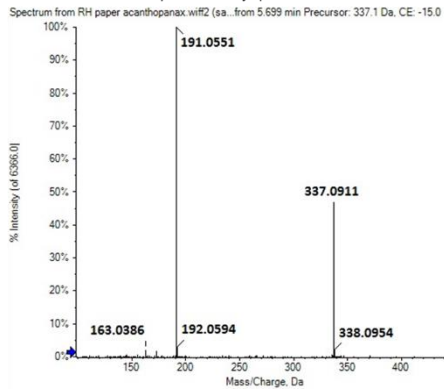
Peak P9. 3-O-caffeoylshikimic acid



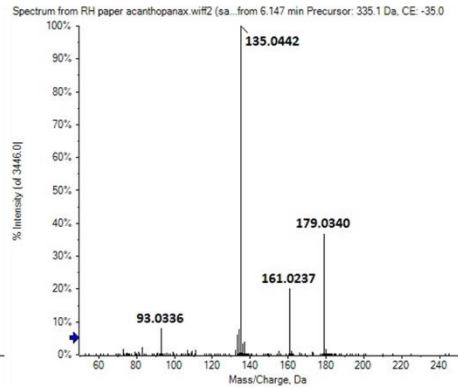
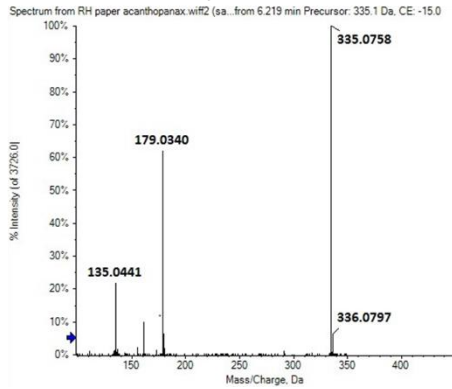
Peak P10. 5-O-feruloylquinic acid



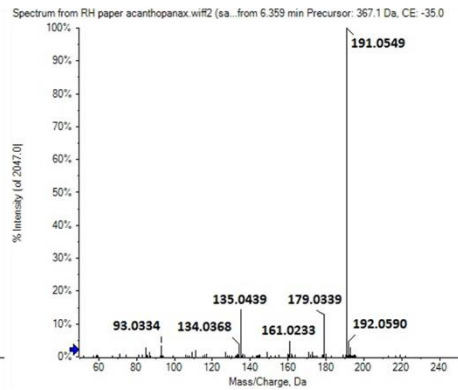
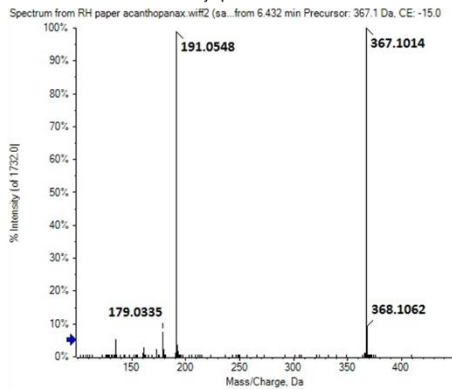
Peak P11. 5-O-*cis*-*p*-coumaroylquinic acid



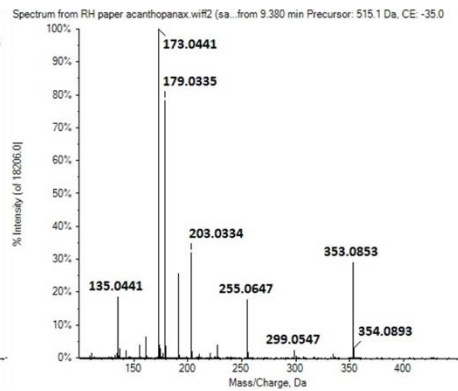
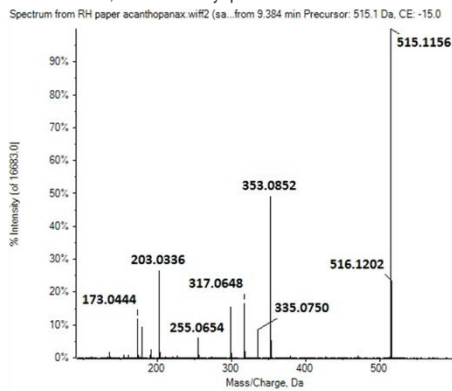
Peak P12. 3-O-*cis*-caffeoylshikimic acid



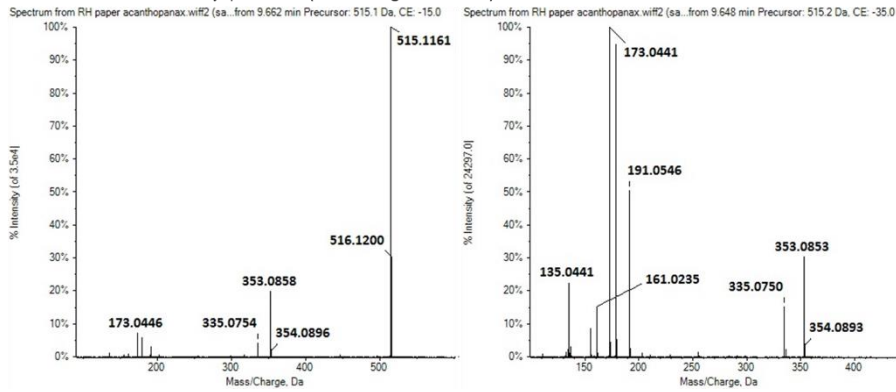
Peak P13. 5-O-*cis*-feruloylquinic acid



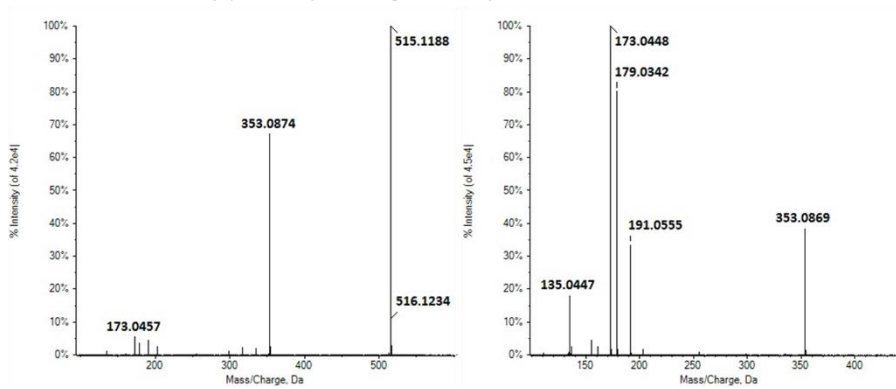
Peak P15. 1,4-di-O-caffeoylquinic acid



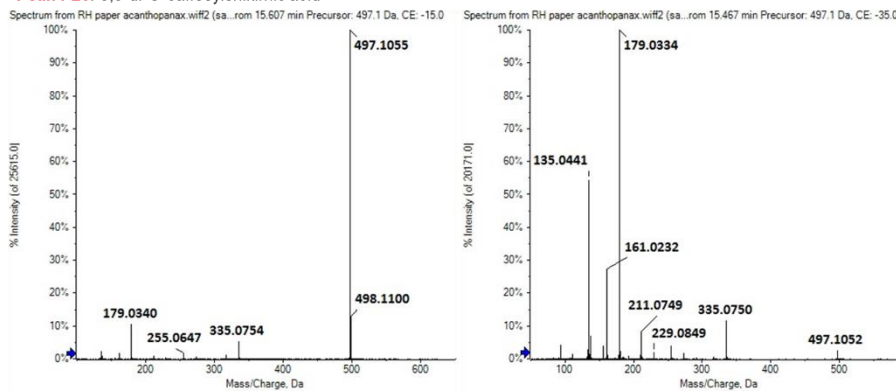
Peak P16. 3,4-di-O-caffeoylquinic acid (isochlorogenic acid C)



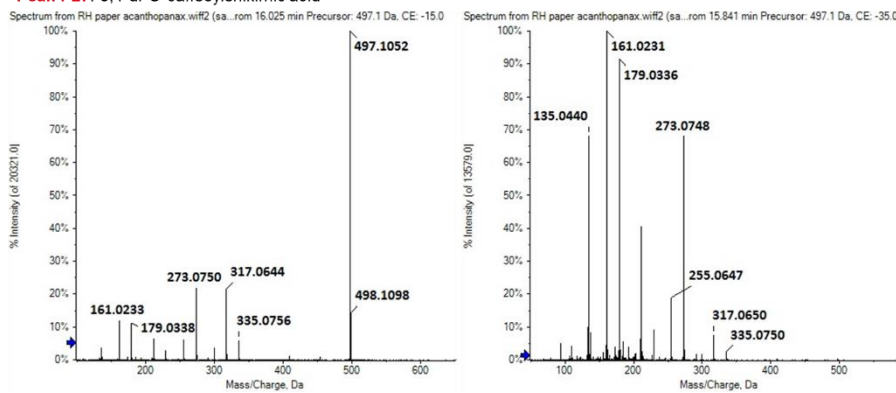
Peak P21. 4,5-di-O-caffeoylquinic acid (isochlorogenic acid B)

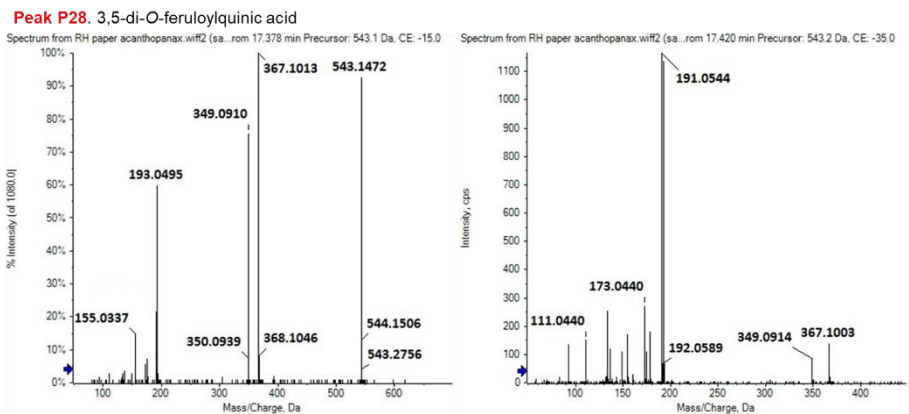


Peak P26. 3,5-di-O-caffeoylshikimic acid

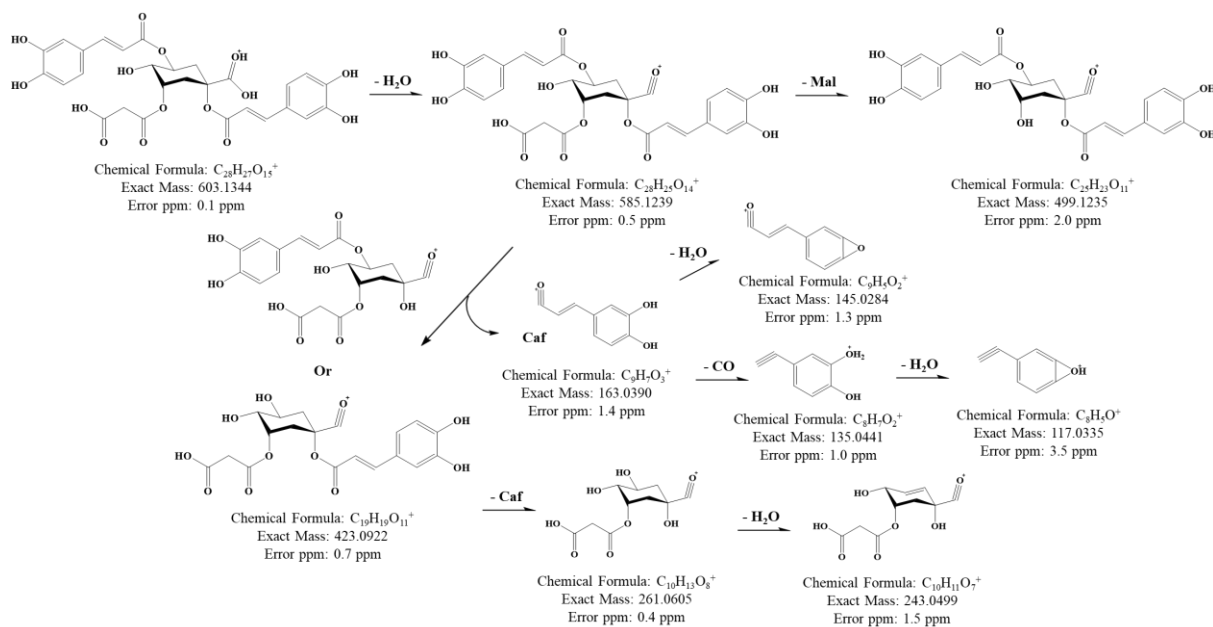


Peak P27. 3,4-di-O-caffeoylshikimic acid

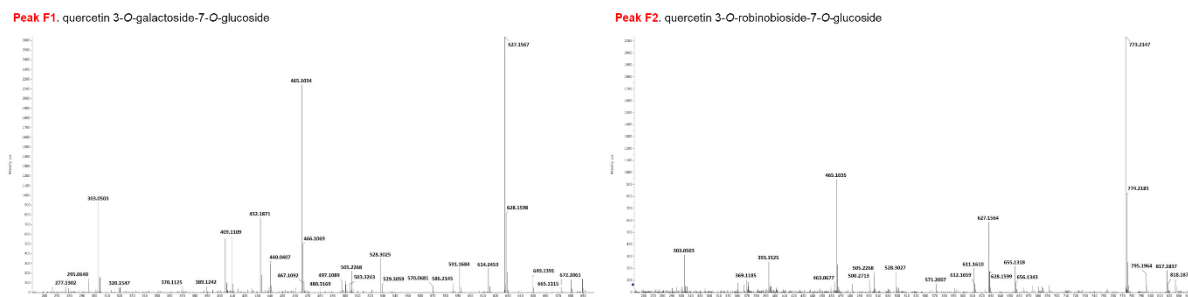




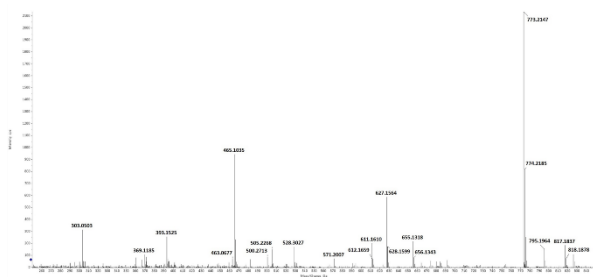
Supplementary Fig. S4 (-) ESI-MS/MS spectra of phenolic acids acquired in IDA mode.



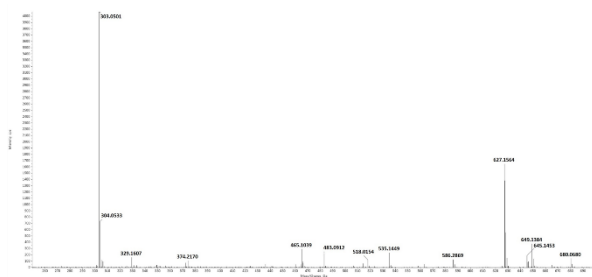
Supplementary Fig. S5 Proposed fragmentation patterns of 3-O-malonyl-1,5-di-O-caffeoylquinic acid



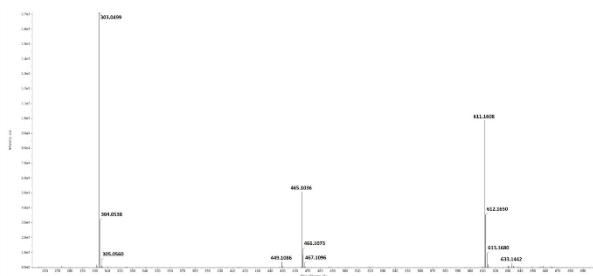
Peak F2. quercetin 3-O-robinobioside-7-O-glucoside



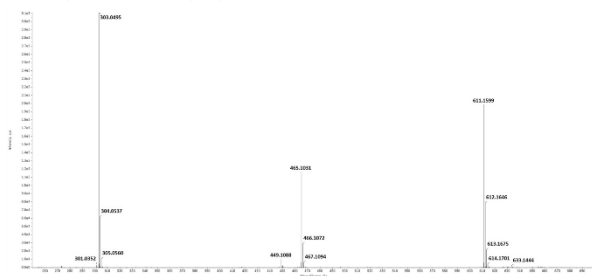
Peak F4. quercetin 3-O-sophoroside



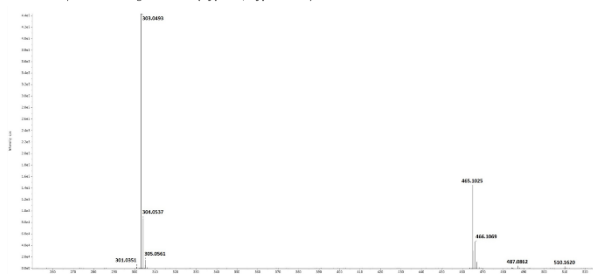
Peak F5. quercetin 3-O-robinobioside



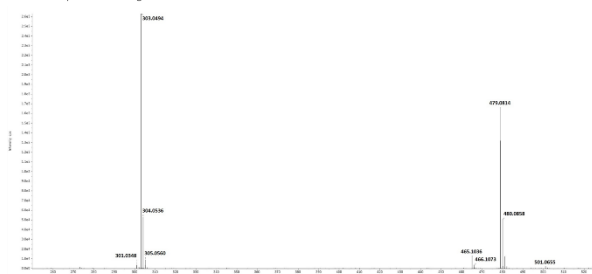
Peak F6. quercetin 3-O-rutinoside (rutin)



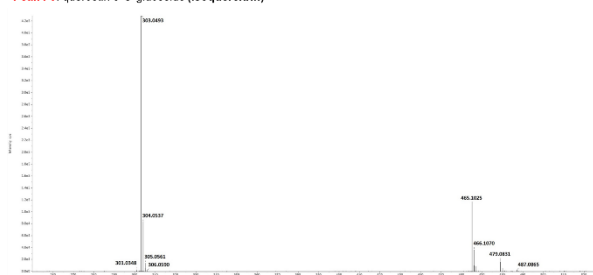
Peak F7. quercetin 3-O-galactoside (hyperin, hyperoside)



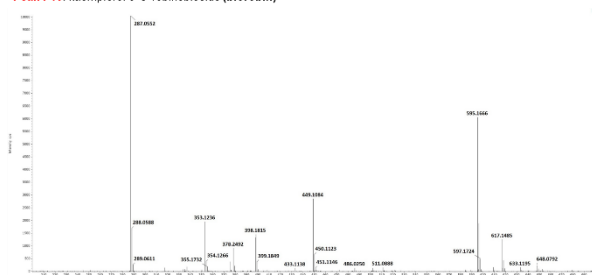
Peak F8. quercetin 3-O-glucuronide



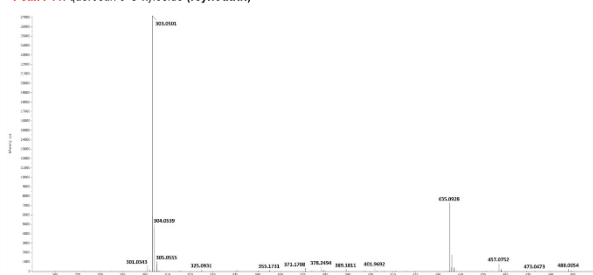
Peak F9. quercetin 3-O-glucoside (isoquercitrin)



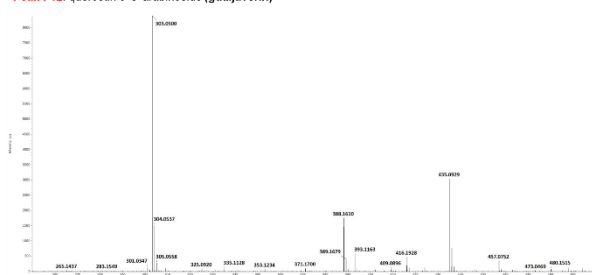
Peak F10. kaempferol 3-O-robinobioside (bisorbin)



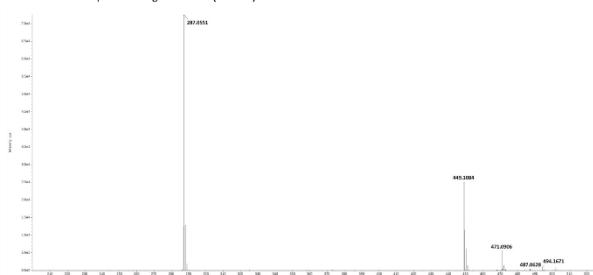
Peak F11. quercetin 3-O-xyloside (reynoutrin)



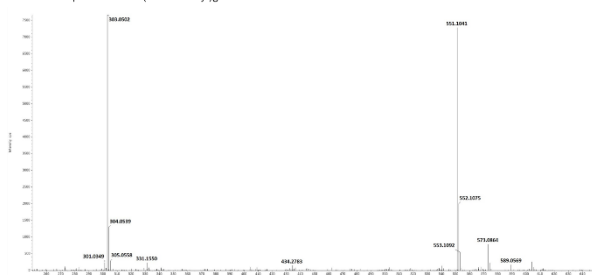
Peak F12. quercetin 3-O-arabinoside (guajaverin)



Peak F13. kaempferol 3-O-galactoside (trifolin)



Peak F14. quercetin 3-O-(6-O-malonyl)glucoside



Year	Number of Publications
1970	1
1971	1
1972	1
1973	1
1974	1
1975	1
1976	1
1977	1
1978	1
1979	1
1980	1
1981	1
1982	1
1983	1
1984	1
1985	1
1986	1
1987	1
1988	1
1989	1
1990	1
1991	1
1992	1
1993	1
1994	1
1995	1
1996	1
1997	1
1998	1
1999	1
2000	1
2001	1
2002	1
2003	1
2004	1
2005	1
2006	1
2007	1
2008	1
2009	1
2010	1
2011	1
2012	1
2013	1
2014	1
2015	1
2016	1
2017	1
2018	1
2019	100
2020	1

Mass spectrum of compound 10. The x-axis represents the mass-to-charge ratio (m/z) from 100 to 550, and the y-axis represents the relative intensity from 0.00 to 1.00. The base peak is at m/z 307.0512. Other labeled peaks include m/z 208.0506, 317.0661, 409.1386, 408.1217, 471.0906, 470.1192, and 552.2004.

Mass spectrum of compound 10. The x-axis represents the mass-to-charge ratio (m/z) from 0 to 350, and the y-axis represents the relative intensity from 0 to 100. The base peak is at m/z 317.0614. Other labeled peaks include:

m/z	Relative Intensity (approx.)
275.0502	15
276.0576	5
276.0615	5
288.0605	10
288.0616	15
314.0597	5
316.1031	5
317.0614	100
317.0615	10
341.1295	10
401.1295	5
401.1300	5
476.1301	25
502.1348	5
502.1355	5
502.1376	5
502.1415	5

Mass spectrum of compound 10. The x-axis represents the mass-to-charge ratio (m/z) from 0 to 250, and the y-axis represents the relative intensity from 0 to 100. The base peak is at m/z 373.0767. Other labeled peaks include:

m/z	Relative Intensity (%)
39.0833	~0.5
75.0859	~0.5
234.2794	~15
373.0767	100
373.0818	~0.5
383.1229	~0.5
383.1264	~0.5
393.1804	~0.5
403.1283	~0.5
403.1337	~0.5
413.1970	~0.5
433.2097	~0.5
433.2151	~0.5
435.1287	~75
435.1336	~0.5
443.2089	~0.5
443.2143	~0.5
479.1289	~10

Year	Number of Publications
1980	1
1981	1
1982	1
1983	1
1984	1
1985	1
1986	1
1987	1
1988	1
1989	1
1990	1
1991	1
1992	1
1993	1
1994	2
1995	3
1996	5
1997	10
1998	20
1999	40
2000	60
2001	80
2002	100
2003	120
2004	140
2005	260
2006	380
2007	500
2008	620
2009	740
2010	860
2011	980
2012	1100
2013	1220
2014	1350
2015	1479
2016	1613
2017	2051
2018	2642
2019	3519

Mass spectrum of compound 10. The x-axis represents the mass-to-charge ratio (m/z) from 300 to 650, and the y-axis represents the relative intensity from 0 to 100. The base peak is at m/z 317.0861.

m/z	Relative Intensity (%)
315.0858	~5
316.0855	~15
317.0860	~5
317.0861	100
319.0911	~5
429.1341	~5
452.2905	~5
465.0907	~5
476.1103	~45
605.1225	~5
606.1008	~5
624.2772	~5

Mass spectrum of compound 10. The x-axis represents the mass-to-charge ratio (m/z) from 286 to 444, and the y-axis represents the relative intensity from 0.00 to 1.00. The base peak is at m/z 287.0533. Other labeled peaks include m/z 289.0537, 291.0539, 432.1126, 434.1178, 436.1157, 438.0904, 440.2112, and 442.1913.

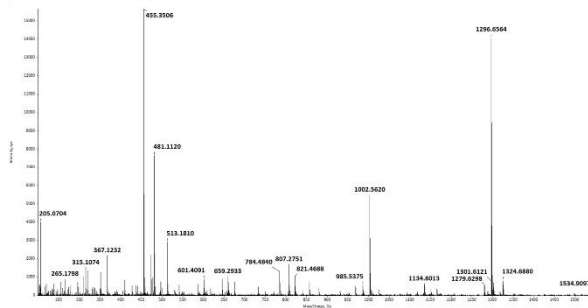
Mass spectrum showing relative intensity (0 to 100) versus m/z (0 to 1000). The base peak is at m/z 312.0860. Other labeled peaks include:

m/z	Relative Intensity (approx)
251.1488	5
271.1051	5
284.1473	5
379.1086	5
401.1245	5
301.1196	10
312.0860	100
333.1145	10
354.1190	10
375.1020	5
387.1440	5
399.1211	5
400.1085	10
415.1033	10
431.1036	10
451.1317	10
461.1880	10
483.1278	20
489.1317	15
471.2967	10
481.1100	10
497.1451	10
501.1377	10
513.1066	10
527.1311	10

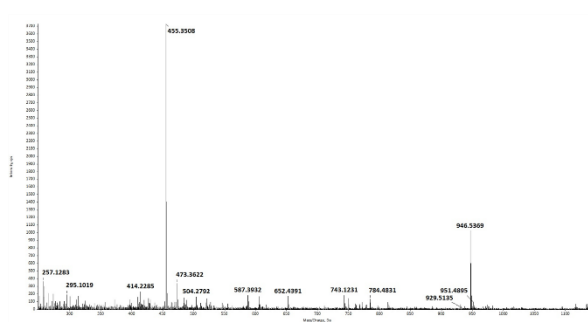
Mass spectrum of the sample showing relative intensity versus m/z. The base peak is at m/z 455.9323. Other significant peaks are labeled at m/z 282.1497, 287.0554, 367.1245, 483.1285, 509.0911, 511.1824, 674.2995, 814.4954, 1007.5177, 1002.5633, 1164.6163, 1316.6691, 1331.6246, and 1347.5987.

Mass spectrum showing relative intensity (Y-axis, 0 to 1000) versus mass-to-charge ratio (X-axis, 80 to 140). The base peak is at m/z 469.5115. Other significant peaks are labeled at m/z 309.1183, 323.1284, 470.3351, 487.9422, 521.1290, 637.2607, 629.2920, 777.1100, 974.5323, 1106.5739, 1235.6074, 1252.6324, 1257.5873, and 1275.5596.

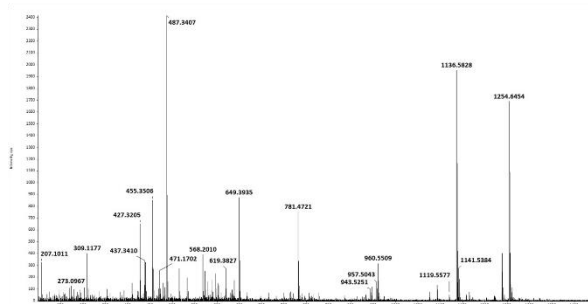
Peak S8. 3-O-glucosyl-(1→2)-arabinosyl-mesembryanthemoidigenic acid 28-O-rhamnosyl-(1→4)-(6-O-acetyl)glucosyl-(1→6)-glucoside (**ciwujianoside A₄**)



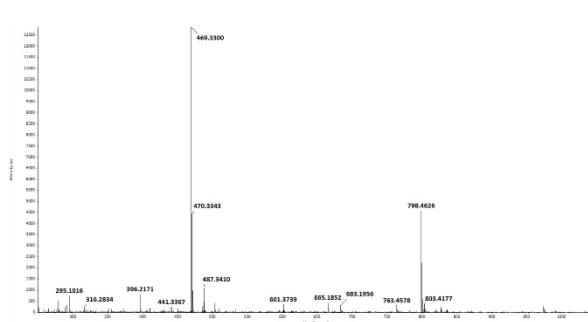
Peak S11. 3-O-glucosyl-(1→2)-arabinosyl-mesembryanthemoidigenic acid 28-O-glucoside



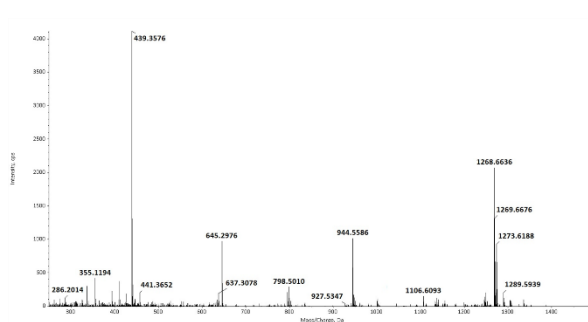
Peak S19. 3-O-glucosyl-11-deoxy-anhydrochiisanogenoic acid 28-O-rhamnosyl-(1→4)-glucosyl-(1→6)-glucoside



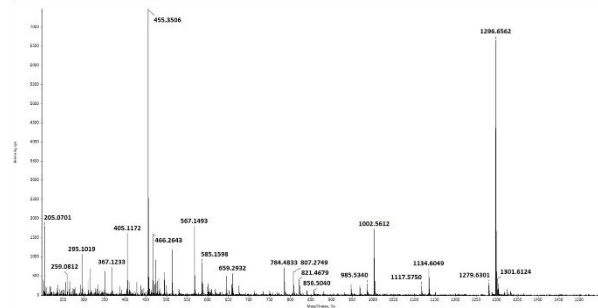
Peak S24. 3-O-glucosyl-(1→2)-arabinosyl-serratagenic acid



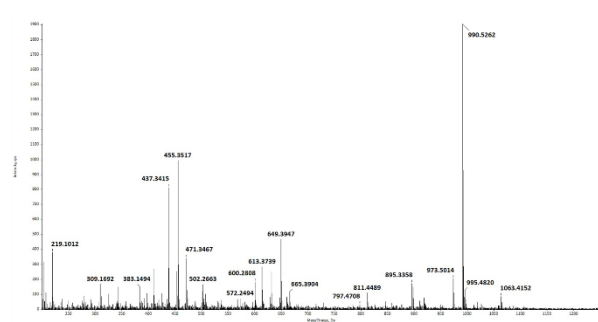
Peak S26. 3-O-sophorosyl-oleanolic acid 28-O-rhamnosyl-(1→4)-glucosyl-(1→6)-glucoside



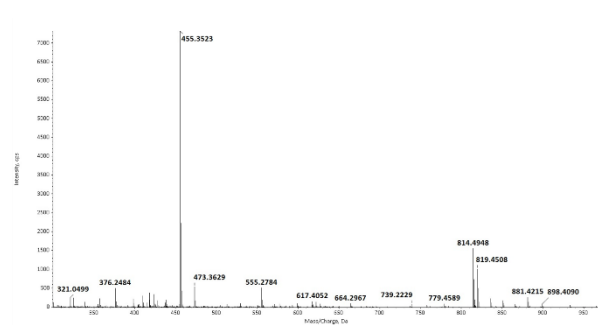
Peak S10. 3-O-glucosyl-(1→3)-arabinosyl-mesembryanthemoidigenic acid 28-O-rhamnosyl-(1→4)-(6-O-acetyl)glucosyl-(1→6)-glucoside



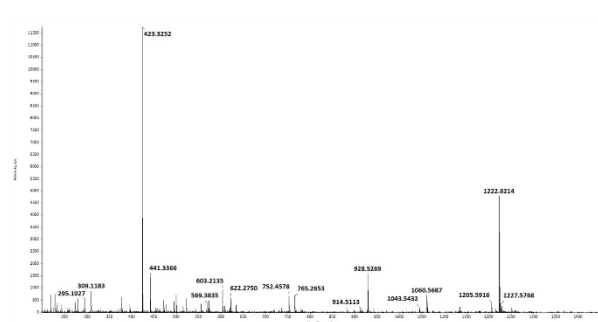
Peak S16. 3-O-glucuronyl-echinocystic acid 28-O-gentiobioside



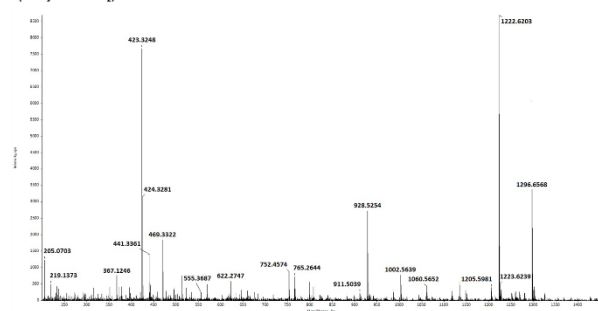
Peak S21. 3-O-sophorosyl-mesembryanthemoidigenic acid



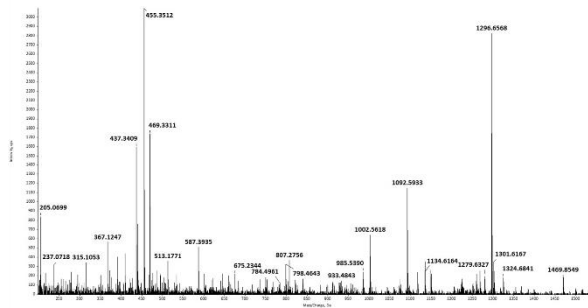
Peak S25. 3-O-glucosyl-(1→3)-arabinosyl-akebonoic acid 28-O-rhamnosyl-(1→4)-glucosyl-(1→6)-glucoside



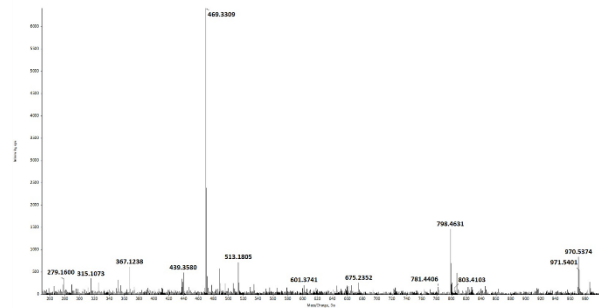
Peak S28. 3-O-glucosyl-(1→2)-arabinosyl-**akebonoic acid** 28-O-rhamnosyl-(1→4)-glucosyl-(1→6)-glucoside (ciwujianoside A₂)



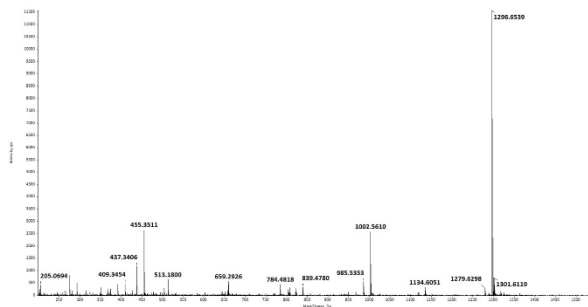
Peak S30. 3-O-glucosyl-(1→3)-arabinosyl-echinocystic acid 28-O-rhamnosyl-(1→4)-(6-O-acetyl)glucosyl-(1→6)-glucoside



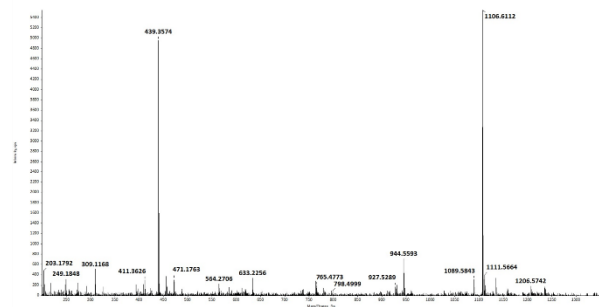
Peak S32. 3-O-glucosyl-(1→3)-arabinosyl-serratagenic acid



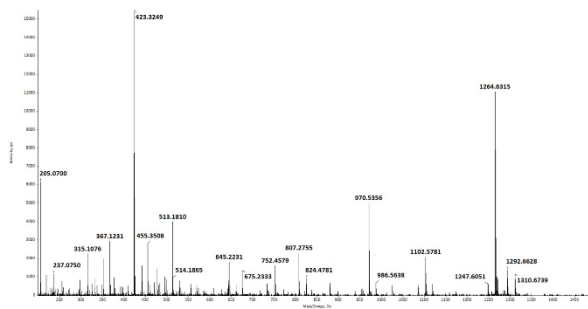
Peak S35. 3-O-glucosyl-(1→2)-arabinosyl-echinocystic acid 28-O-rhamnosyl-(1→4)-(6-O-acetyl)glucosyl-(1→6)-glucoside



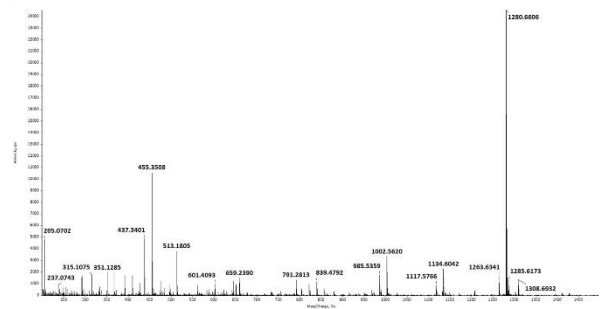
Peak S40. 3-O-glucosyl-oleanolic acid 28-O-rhamnosyl-(1→4)-glucosyl-(1→6)-glucoside (nipponoside B)



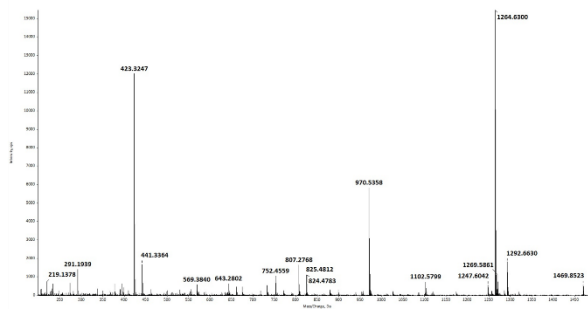
Peak S41. 3-O-glucosyl-(1→3)-arabinosyl-akebonic acid 28-O-rhamnosyl-(1→4)-(6-O-acetyl)glucosyl-(1→6)-glucoside



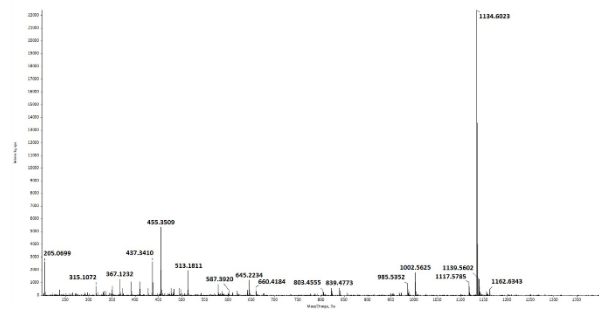
Peak S43. 3-O-rhamnosyl-(1→2)-arabinosyl-echinocystic acid 28-O-rhamnosyl-(1→4)-(6-O-acetyl)glucosyl-(1→6)-glucoside



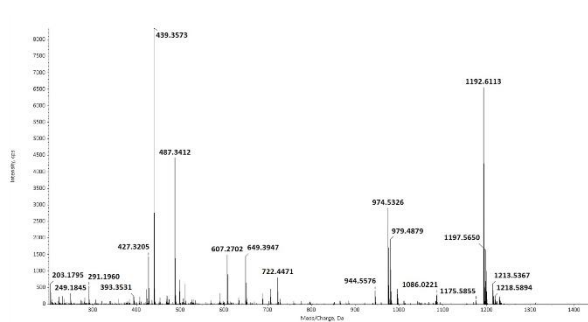
Peak S45. 3-O-glucosyl-(1→2)-arabinosyl-akebonic acid 28-O-rhamnosyl-(1→4)-(6-O-acetyl)glucosyl-(1→6)-glucoside (acanthopanoxoside A)



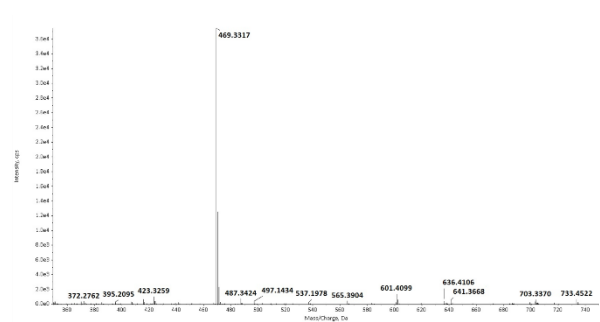
Peak S49. 3-O-arabinosyl-echinocystic acid 28-O-rhamnosyl-(1→4)-(6-O-acetyl)glucosyl-(1→6)-glucoside



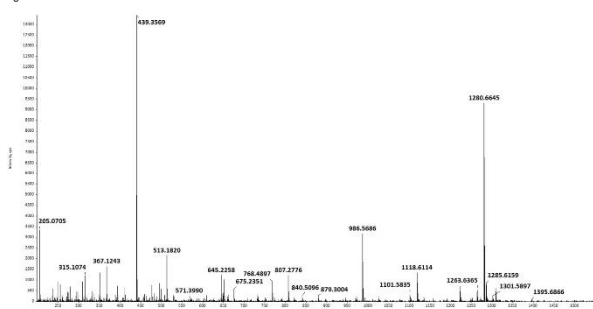
Peak S51. 3-O-(6-O-malonyl)glucosyl-oleanolic acid 28-O-rhamnosyl-(1→4)-glucosyl-(1→6)-glucoside



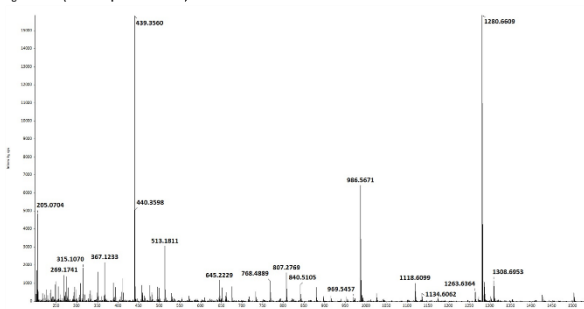
Peak S54. 3-O-arabinosyl-serratagenic acid



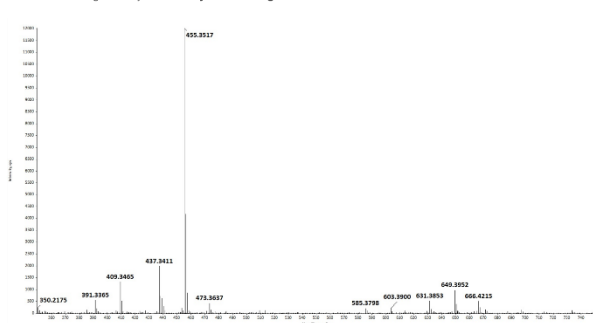
Peak S58. 3-O-glucosyl-(1→3)-arabinosyl-oleanolic acid 28-O-rhamnosyl-(1→4)-(6-O-acetyl)glucosyl-(1→6)-glucoside



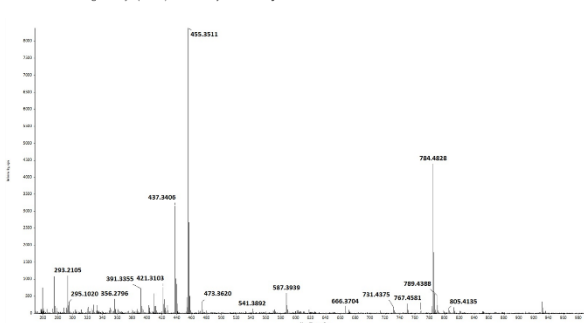
Peak S59. 3-O-glucosyl-(1→2)-arabinosyl-oleanolic acid 28-O-rhamnosyl-(1→4)-(6-O-acetyl)glucosyl-(1→6)-glucoside (acanthopanaxoside B)



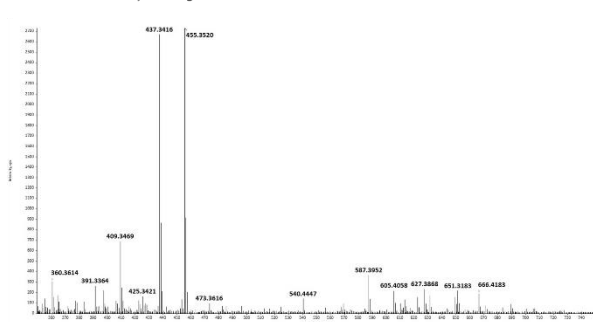
Peak S63. 3-O-glucuronyl-mesembryanthemoidenic acid



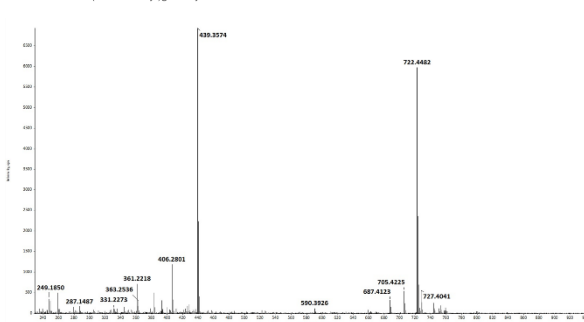
Peak S70. 3-O-glucosyl-(1→2)-arabinosyl-echinocystic acid



Peak S76. 3-O-arabinosyl-hederagenin



Peak S82. 3-O-(6-O-malonyl)glucosyl-oleanolic acid



Supplementary Fig. S7 (+) ESI-MS spectra of triterpenoid saponins.

A) Shoot



B) Leave



C) Fruit



D) Stem



Supplementary Fig. S8 The shoots, leaves, fruits, and stems of *Acanthopanax senticosus*.