



Supplementary Material

Antioxidant, Pancreatic Lipase Inhibitory, and Tyrosinase Inhibitory Activities of Extracts of the Invasive Plant *Spartina anglica* (Cord-grass)

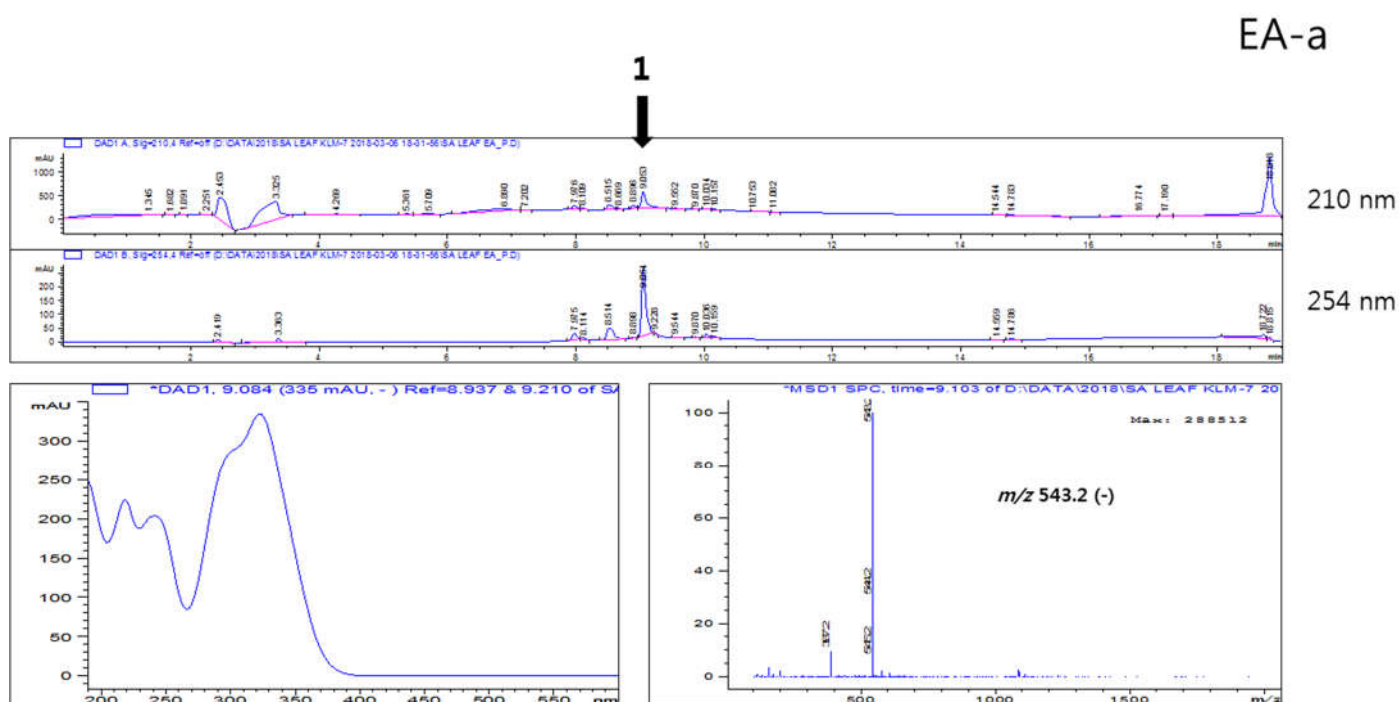


Figure S1. LC-ESI-MS data of EA-a.

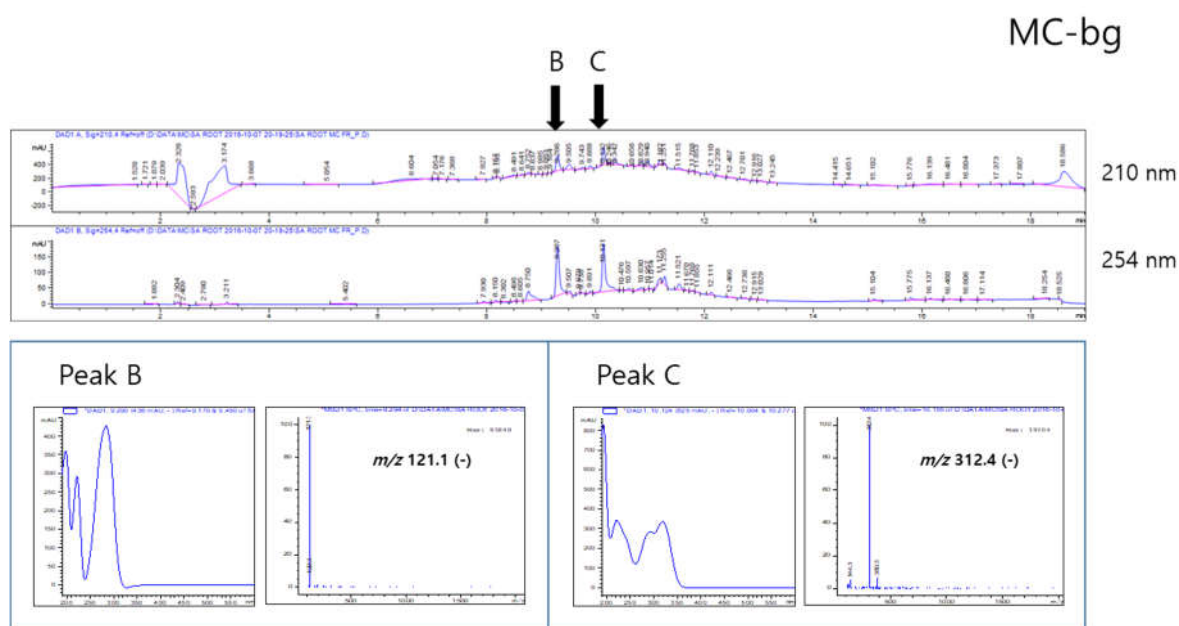
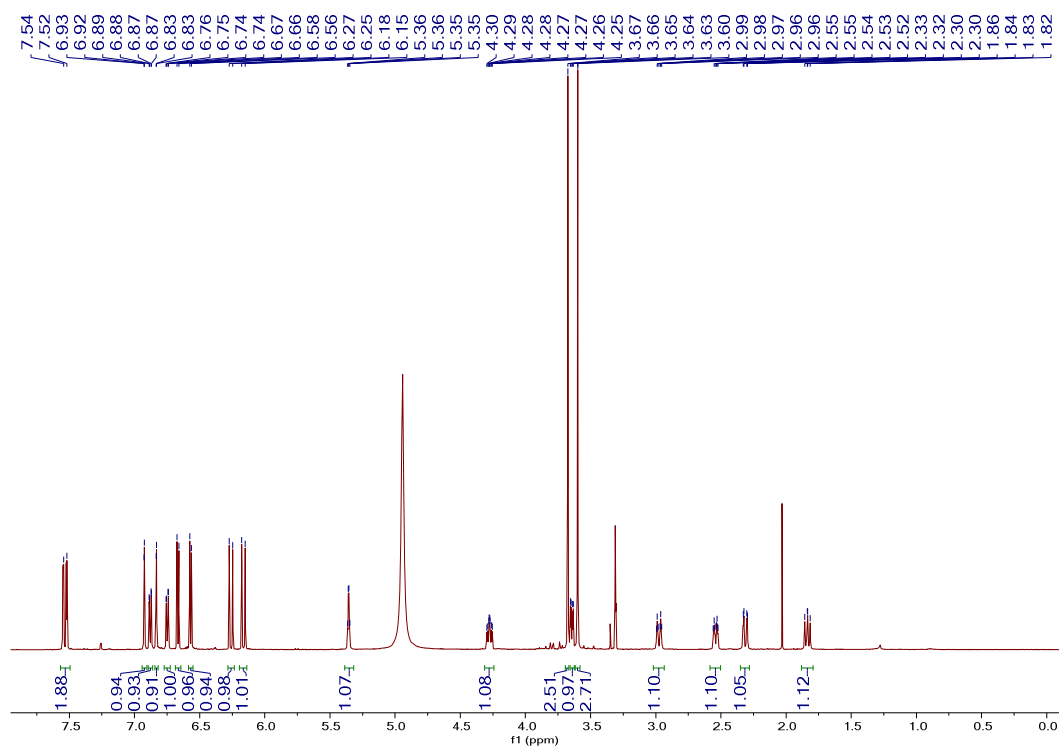
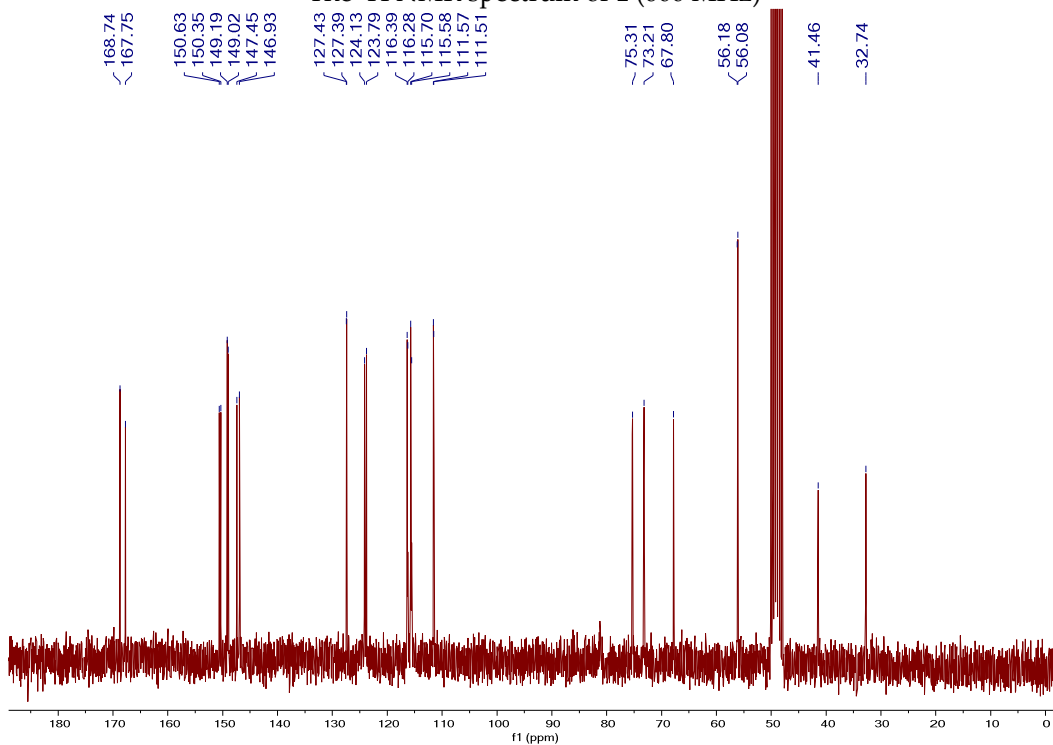


Figure S2. LC-ESI-MS data of MC-bg.

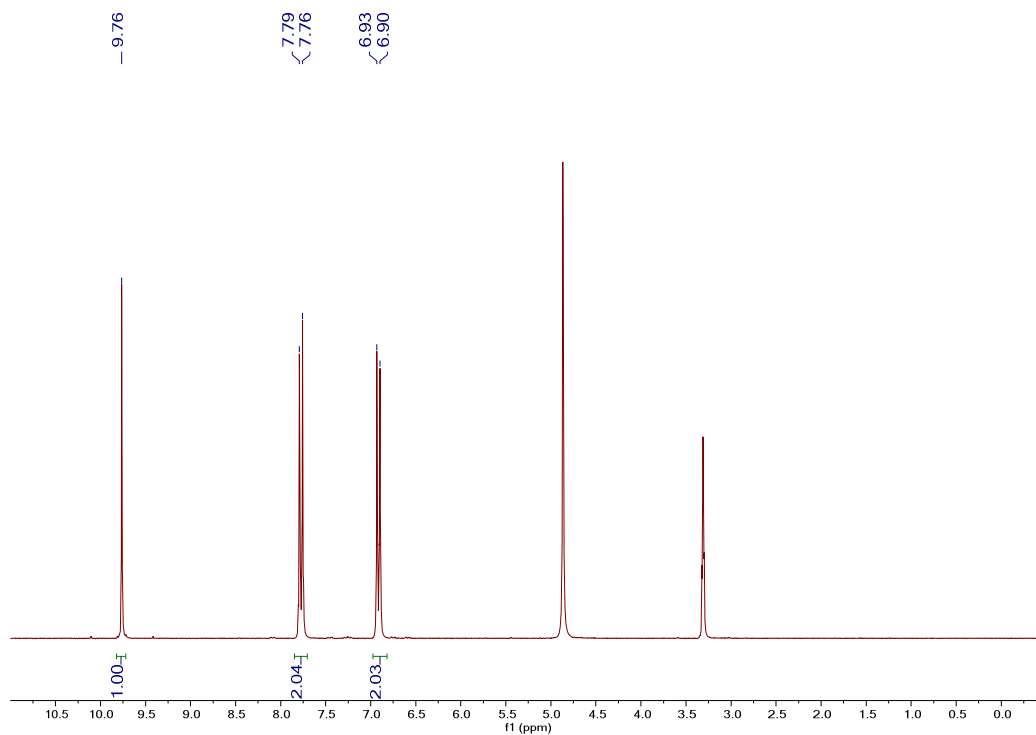


The ^1H NMR spectrum of **1** (600 MHz)

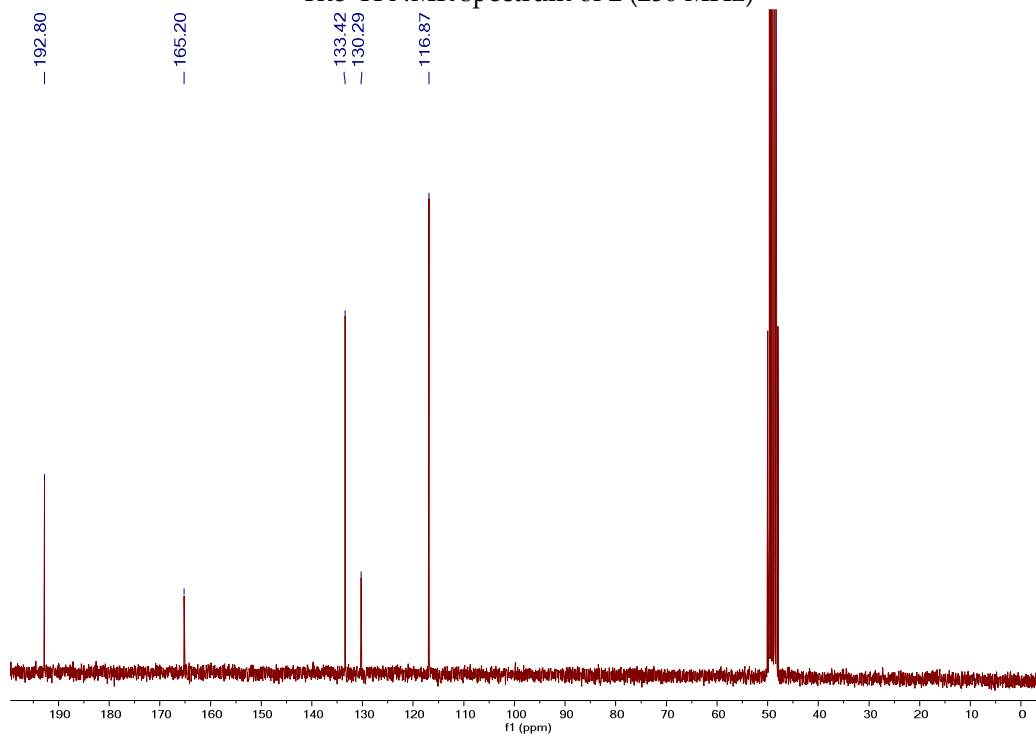


The ^{13}C NMR spectrum of **1** (62.5 MHz)

Figure S3. 1D NMR spectra of compound **1** in CD_3OD .

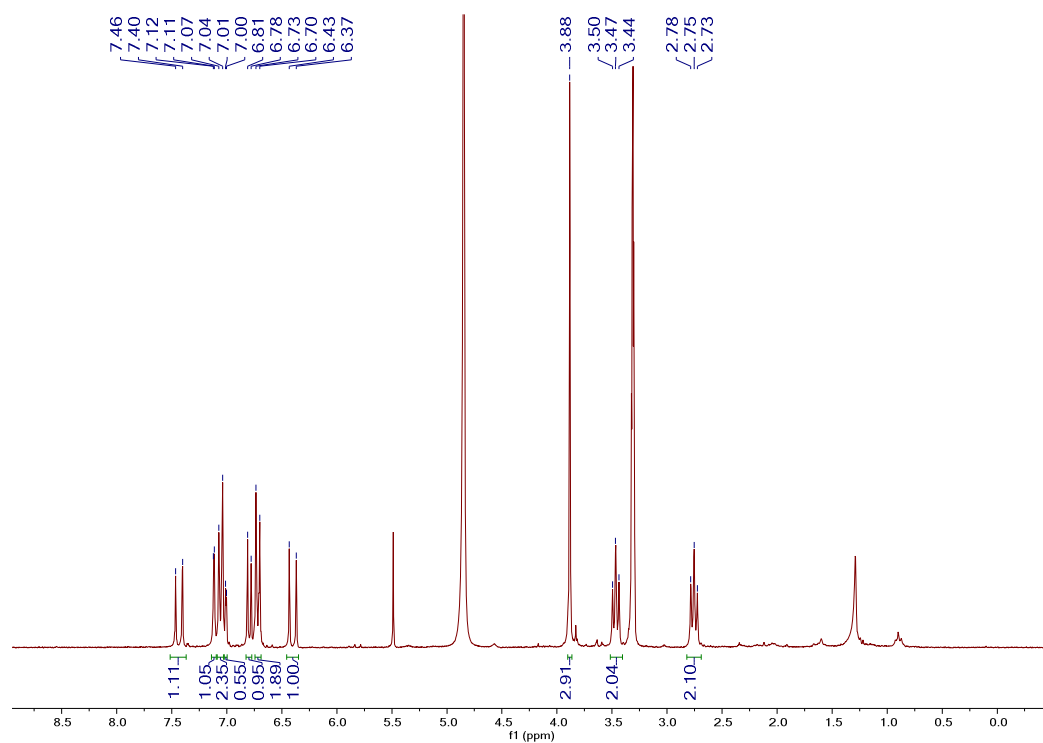


The ^1H NMR spectrum of 2 (250 MHz)

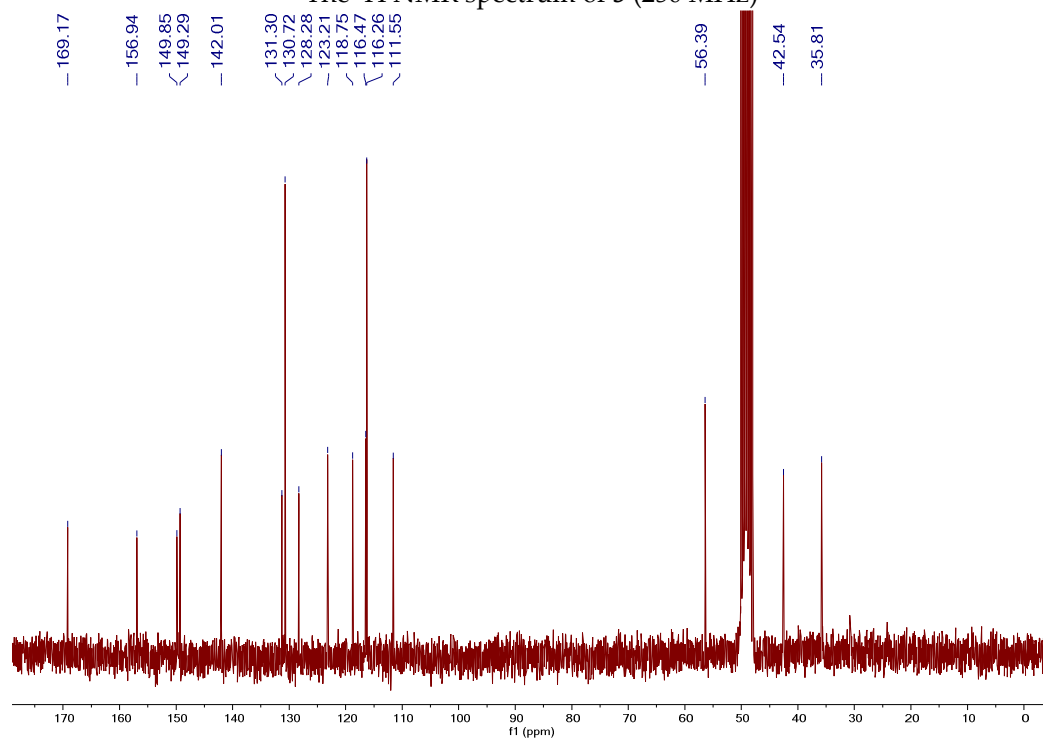


The ^{13}C NMR spectrum of 2 (62.5 MHz)

Figure S4. 1D NMR spectra of compound 2 in CD_3OD .



The ^1H NMR spectrum of **3** (250 MHz)



The ^{13}C NMR spectrum of **3** (62.5 MHz)

Figure S5. 1D NMR spectra of compound **3** in CD_3OD .

qHNMR of EA-a

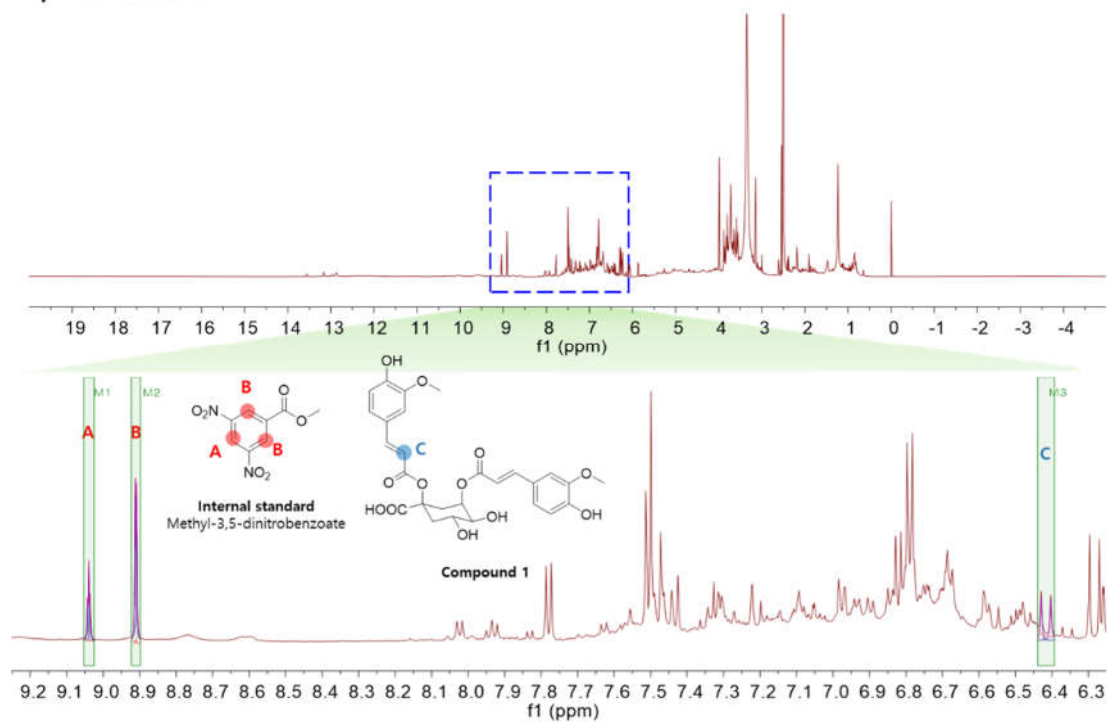


Figure S6. qHNMR spectrum of compound 1 in EA-a with an internal standard.

qHNMR of MC-bg

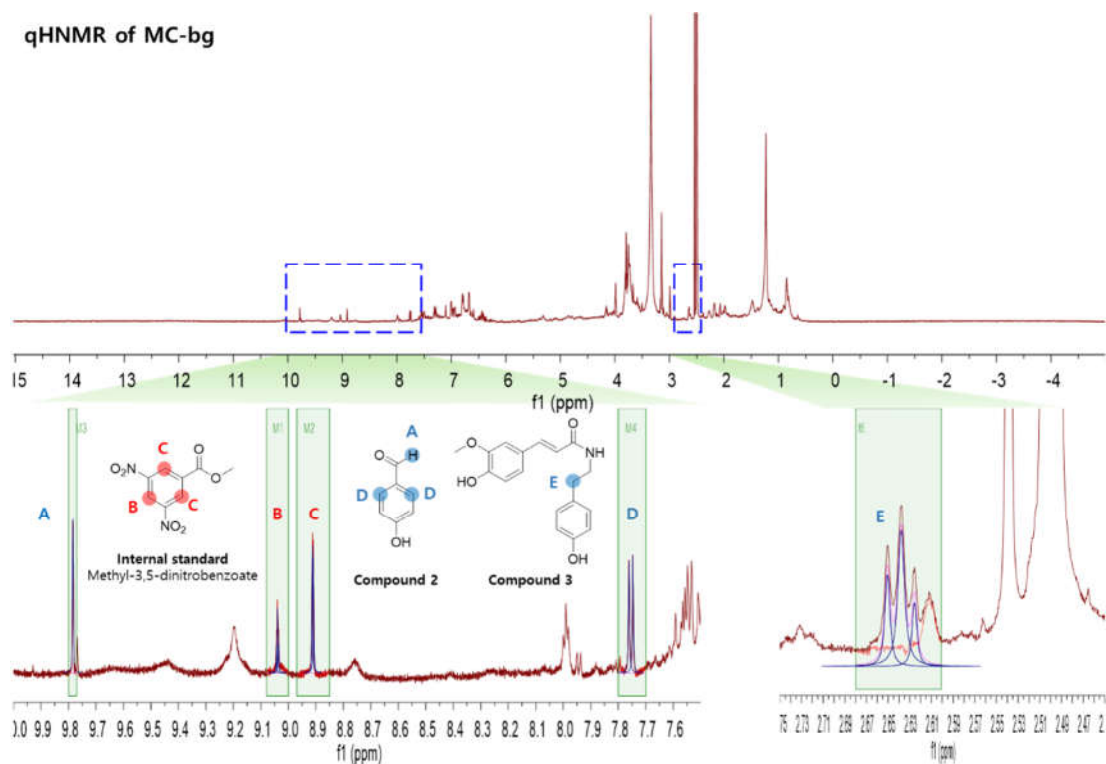
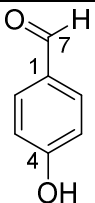


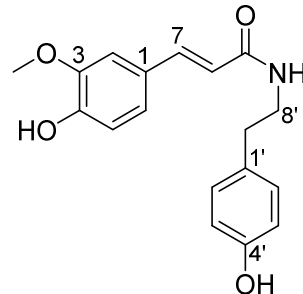
Figure S7. qHNMR spectrum of compounds 2 and 3 in MC-bg with an internal standard

Table S1. NMR data of *p*-hydroxybenzaldehyde (**2**) in CD₃OD.

		
	δC^1	δH^2
1	130.29, C	
2	133.42, CH	7.77 (1H, d, $J = 8.7$)
3	116.87, CH	6.91 (1H, d, $J = 8.7$)
4	165.20, C	
5	116.87, CH	6.91 (1H, d, $J = 8.7$)
6	133.42, CH	7.77 (1H, d, $J = 8.7$)
7	192.80, CH	9.76 (1H, s)

¹ Measured in CD₃OD with 62.5 MHz. ² Measured in CD₃OD with 250 MHz.

Table S2. NMR data of *N-trans-feruloyltyramine* (**3**) in CD₃OD.

		
	δC^1	δH^2
Feruloyl		
1	131.30, C	
2	111.55, CH	7.12 (1H, d, $J = 1.9$)
3	149.29, C	
4	149.85, C	
5	116.47, CH	6.79 (1H, d, $J = 8.4$)
6	123.21, CH	7.00 (1H, dd, $J = 8.4, 1.9$)
7	142.01, CH	7.43 (1H, d, $J = 15.7$)
8	118.75, CH	6.40 (1H, d, $J = 15.7$)
9	169.17, C	
3-OCH ₃	56.39, CH ₃	3.88 (3H, s)
Tyramine		
1'	128.28, C	
2'	130.72, CH	7.06, (1H, d, $J = 8.5$)
3'	116.26, CH	6.72 (1H, d, $J = 8.5$)
4'	156.94, C	
5'	116.26, CH	6.72 (1H, d, $J = 8.5$)
6'	130.72, CH	7.06 (1H, d, $J = 8.5$)
7'	42.54, CH ₂	2.75 (1H, d, $J = 7.4$)
8'	35.81, CH ₂	3.47 (1H, d, $J = 7.4$)

¹ Measured in CD₃OD with 62.5 MHz. ² Measured in CD₃OD with 250 MHz.

Table S3. DPPH radical scavenging activity of 1-3.

Concentration ($\mu\text{g/mL}$)	DPPH Radical Scavenging (%)			
	L-Ascorbic Acid	1	2	3
500	- ¹	101.99 $\pm$ 0.37	8.66 $\pm$ 0.30	97.23 $\pm$ 0.33
250	98.14 $\pm$ 0.15	100.78 $\pm$ 1.46	7.28 $\pm$ 0.80	95.51 $\pm$ 0.10
100	97.03 $\pm$ 0.26	89.88 $\pm$ 1.25	3.89 $\pm$ 2.50	93.65 $\pm$ 1.70
50	97.28 $\pm$ 0.27	85.92 $\pm$ 1.27	3.78 $\pm$ 1.40	78.51 $\pm$ 0.06
25	97.50 $\pm$ 0.53	82.94 $\pm$ 0.56	3.61 $\pm$ 1.11	70.53 $\pm$ 1.74
10	98.01 $\pm$ 0.07	51.54 $\pm$ 1.30	4.43 $\pm$ 0.36	63.25 $\pm$ 0.83
5	97.41 $\pm$ 0.46	38.70 $\pm$ 2.24	3.58 $\pm$ 1.79	54.29 $\pm$ 0.30
2	87.36 $\pm$ 2.24	24.91 $\pm$ 0.78	2.73 $\pm$ 2.15	14.90 $\pm$ 1.63
1	45.09 $\pm$ 1.40	11.87 $\pm$ 0.82	2.93 $\pm$ 2.39	0.86 $\pm$ 2.12

¹Not tested.

Table S4. ABTS radical scavenging activity of 1-3.

Concentration ($\mu\text{g/mL}$)	ABTS Radical Scavenging (%)			
	L-Ascorbic Acid	1	2	3
50	99.77 $\pm$ 0.08	66.38 $\pm$ 1.47	8.71 $\pm$ 0.21	82.19 $\pm$ 1.38
25	99.75 $\pm$ 0.06	66.31 $\pm$ 1.84	3.97 $\pm$ 0.43	78.71 $\pm$ 0.06
5	70.41 $\pm$ 0.28	27.97 $\pm$ 4.11	2.03 $\pm$ 0.00	44.18 $\pm$ 2.64

Table S5. Pancreatic lipase inhibition by 1-3.

Concentration ($\mu\text{g/mL}$)	Inhibition of Pancreatic Lipase (%)			
	Orlistat	1	2	3
100	- ¹	41.11 $\pm$ 0.01	52.65 $\pm$ 0.00	17.28 $\pm$ 0.02
50	- ¹	37.95 $\pm$ 0.02	42.68 $\pm$ 0.01	16.96 $\pm$ 0.02
25	- ¹	21.17 $\pm$ 0.01	36.64 $\pm$ 0.02	15.87 $\pm$ 0.02
10	- ¹	0.73 $\pm$ 0.01	15.07 $\pm$ 0.01	14.76 $\pm$ 0.01
1.00	54.53 $\pm$ 0.02	- ¹	- ¹	- ¹
0.50	51.17 $\pm$ 0.01	- ¹	- ¹	- ¹
0.25	27.63 $\pm$ 0.01	- ¹	- ¹	- ¹
0.10	22.98 $\pm$ 0.01	- ¹	- ¹	- ¹

¹Not tested.

Table S6. Spiked qHNMR data of compound 1 in EA-a.

	% w/w of Compound 1 in EA-a Sample	Amount of Compound 1 (mg)	Spiked Amount of 1 (mg)	% w/w of Compound 1 in Spiked EA-a Sample	Amount of Compound 1 in Spiked Sample (mg)	Amount of Spiked Compound 1 in Spiked Sample (mg)
EA-a 1	4.35	0.435	0.500	9.35	0.935	0.500
EA-a 2	4.76	0.465		9.79	0.989	0.524
EA-a 3	4.83	0.488		9.57	0.967	0.479
Average	4.65	0.463	0.500	9.57	0.963	0.501
S.D.	0.26	0.027	-	0.22	0.027	0.023
C.V.	0.06	0.058	-	0.02	0.028	0.045

Table S7. qHNMR data of compounds **2** and **3** in MC-bg.

	% w/w of Compound 2 in EA-a sample	Amount of Compound 2 (mg)	% w/w of Compound 3 in EA-a Sample	Amount of Compound 3 (mg)
MC-bg 1	0.87	0.087	4.64	0.464
MC-bg 2	0.86	0.086	4.60	0.460
MC-bg 3	0.88	0.088	4.58	0.458
Average	0.87	0.087	4.61	0.461
S.D.	0.01	0.001	0.03	0.003
C.V.	0.01	0.011	0.01	0.007