Supplementary information

^{13}C NMR spectroscopic data of compounds:

Artobiloxanthone (2) ^{13}C NMR (125 MHz, acetone-d_6) δ 21.99 (C-12), 22.27 (C-9), 28.20 (C-18), 28.54 (C-17), 38.14 (C-10), 78.71 (C-16), 99.78 (C-6), 102.03 (C-8), 103.7 (C-3'), 105.51 (C-4a), 107.03 (C-1'), 111.43 (C-3), 111.91 (C-13), 116.14 (C-14), 127.88 (C-6'), 129.88 (C-15), 136.68 (C-5'), 145.35 (C-4'), 150.92 (C-11), 151.57 (C-2'), 152.31 (C-8a), 159.48 (C-7), 161.80 (C-5), 162.57 (C-2), 181.27 (C=O, C-4).

Artoindonesianin P (3) ^{13}C NMR (125 MHz, acetone-d_6) δ 21.18 (C-9), 23.07 (C-12), 28.54 (C-13), 50.05 (C-10), 94.44 (C-11), 95.23 (C-8), 100.11 (C-6), 105.22 (C-1'), 105.27 (C-4a), 103.73(C-3'), 112.96 (C-3), 133.92 (C-6'), 138.35 (C-5'), 147.88 (C-4'), 152.16 (C-2'), 158.57 (C-8a), 162.63 (C-5), 163.16 (C-2), 165.39 (C-7), 181.98 (C=O, C-4).

Cycloartobiloxanthone (4) ^{13}C NMR (125 MHz, acetone-d_6) δ 20.61 (C-9), 23.10 (C-13), 28.51 (C-18), 28.53 (C-17), 28.71(C-12), 47.78 (C-10), 78.99 (C-16), 93.97 (C-11), 100.19 (C-6), 102.14 (C-8), 105.13 (C-4a), 105.64 (C-1'), 105.64 (C-3'), 112.95 (C-3), 116.21 (C-14), 128.16 (C-15), 133.96 (C-6'), 138.17 (C-5'), 147.30 (C-4'), 151.84 (C-2'), 152.31 (C-8a), 159.77 (C-5), 161.78 (C-2), 162.88 (C-7), 181.69 (C=O, C-4).

Artonin E (6) ^{13}C NMR (125 MHz, acetone-d_6) δ 18.02 (C-13), 25.03 (C-9), 26.19 (C-12), 28.62 (C-17 and C-18), 79.12 (C-16), 100.06 (C-6), 101.94 (C-8), 105.07(C-3'), 105.94 (C-4a), 111.76 (C-1'), 115.79 (C-14), 117.40 (C-6'), 121.99 (C-3), 122.84 (C-10), 128.36 (C-15), 132.67 (C-11), 139.45 (C-5'), 149.83 (C-4'), 150.13 (C-2'), 153.61 (C-8a), 160.29 (C-7), 162.59 (C-5), 163.09 (C-2), 183.63 (C=O, C-4).

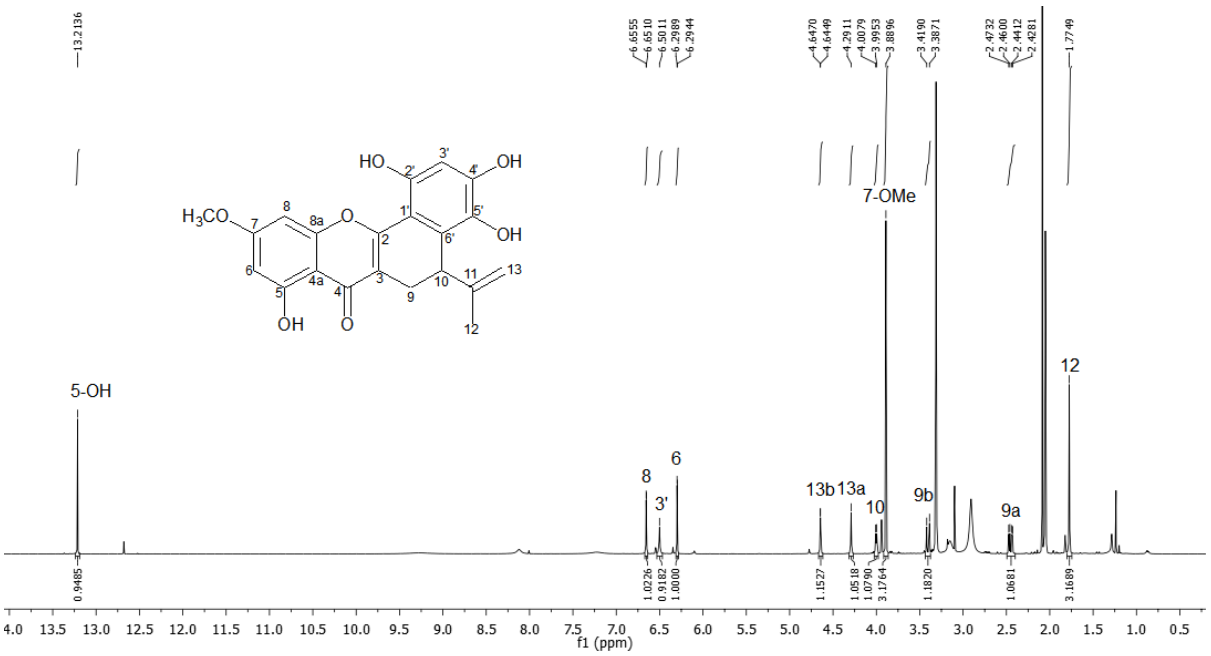


Figure S1. ^{1}H-NMR spectrum of compound **1** (500mHz, acetone-d_6)

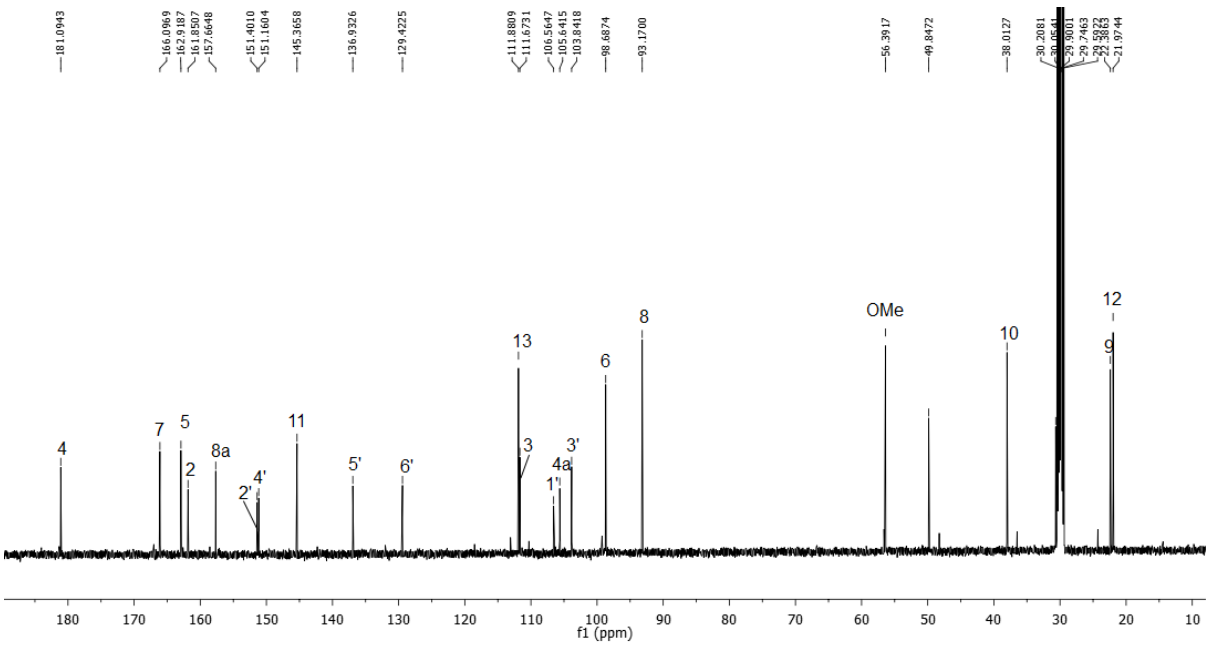


Figure S2. ^{13}C-NMR spectrum of compound **1** (125mHz, acetone-d_6)

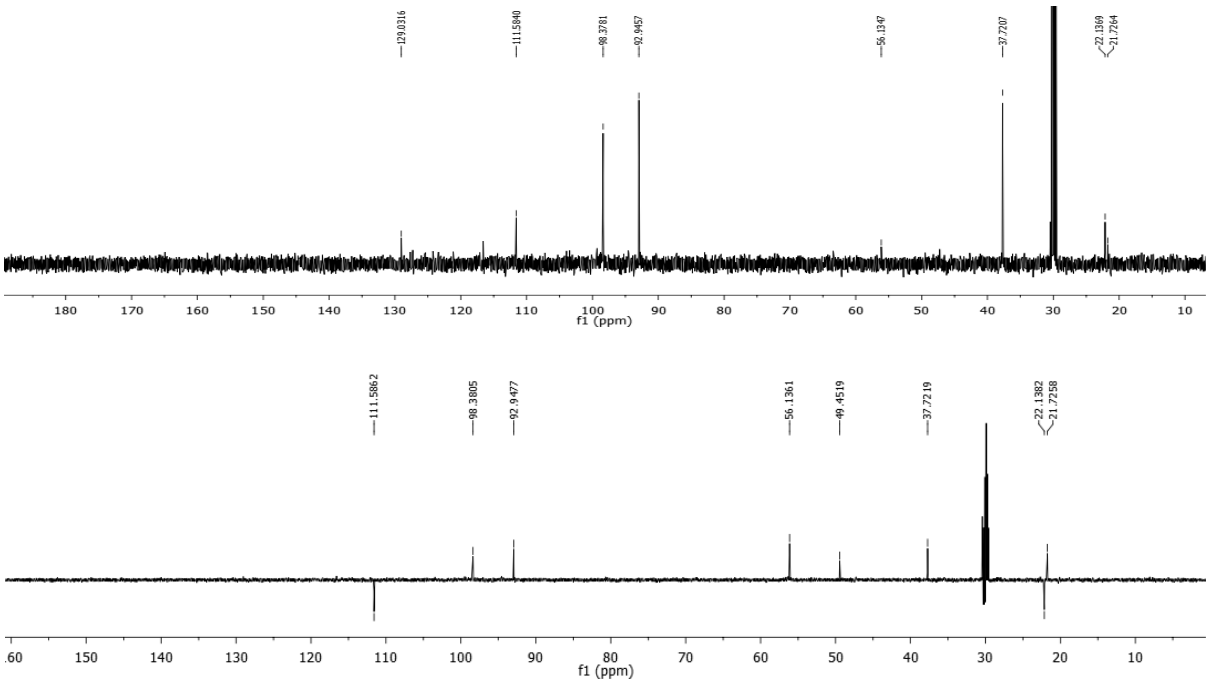


Figure S3. DEPT-90 and -135 spectrum of compound **1**.

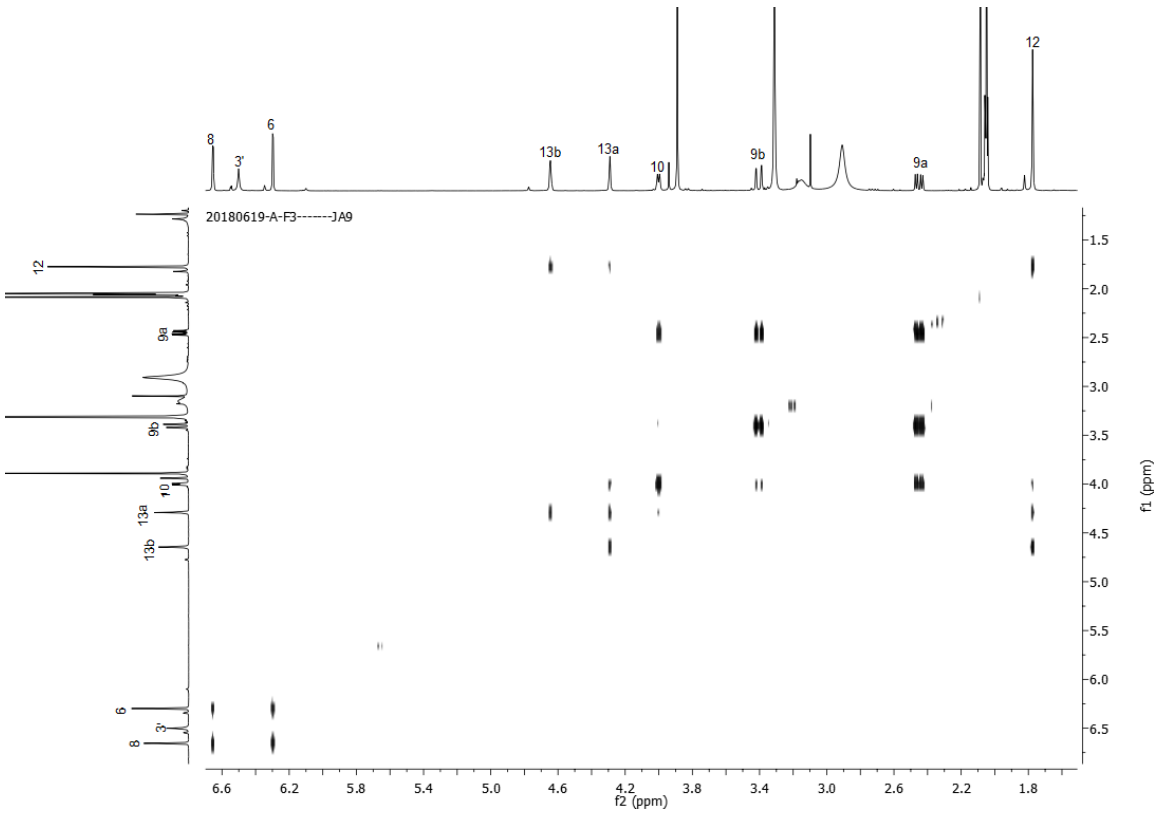


Figure S4. COSY spectrum of compound **1**.

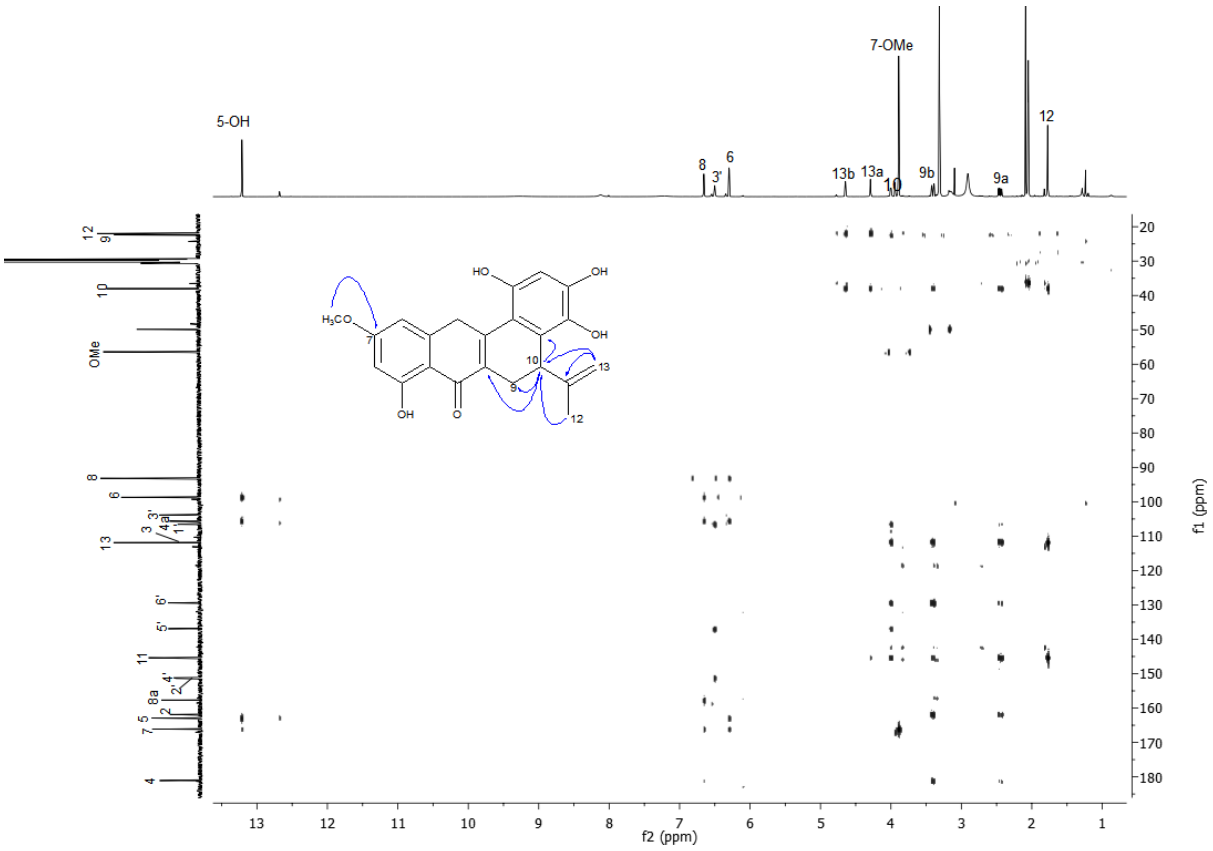


Figure S5. HMBC spectrum of compound **1**.

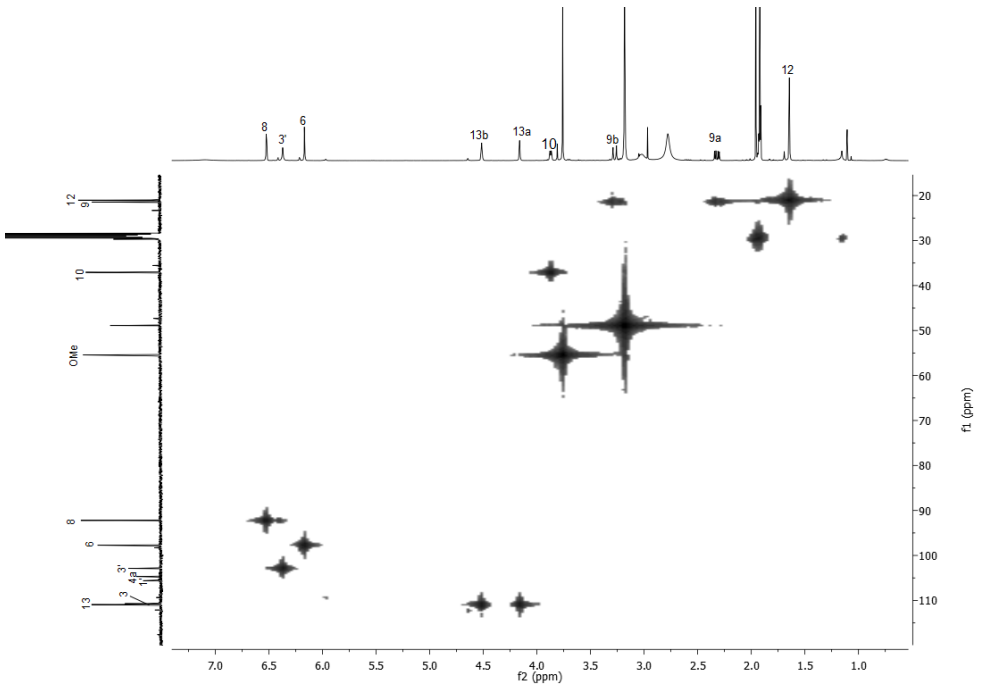
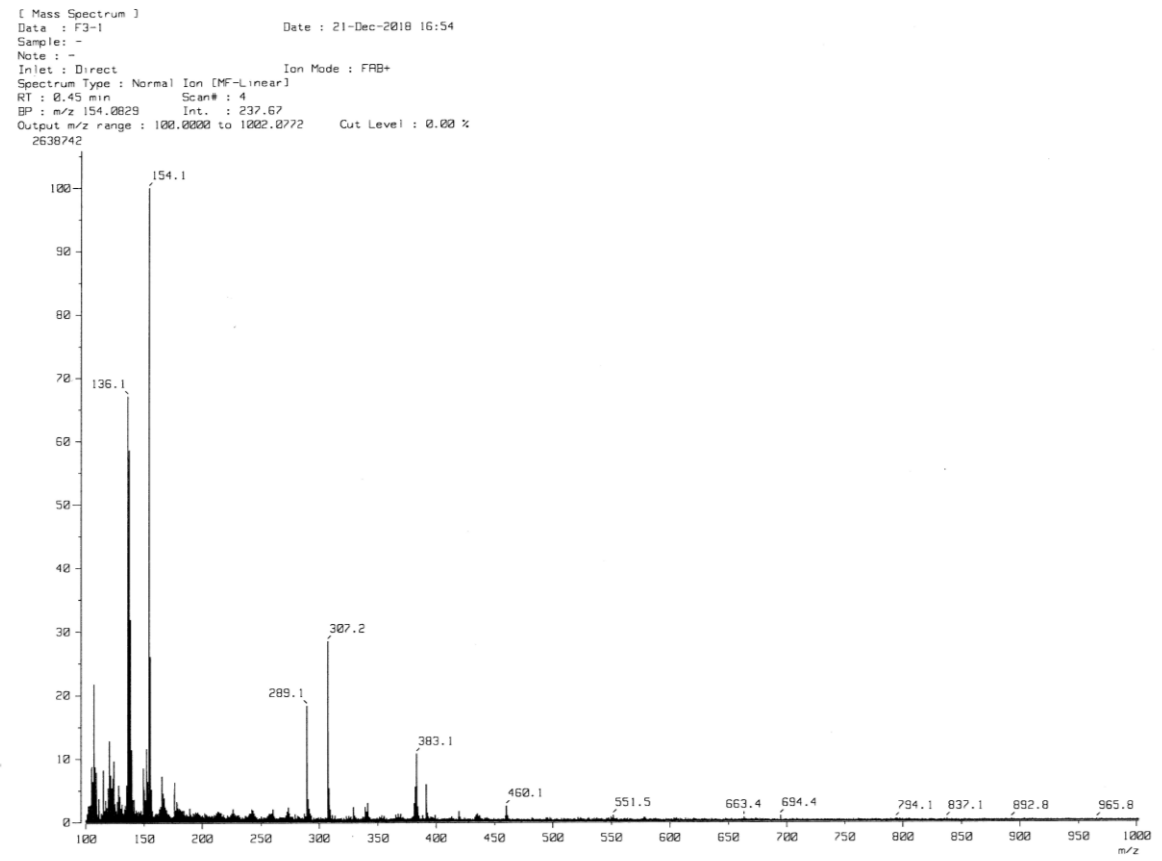


Figure S6. HMQC spectrum of compound **1**.




```
[ Elemental Composition ]                                          Pag
Data  : A-F3_HR                        Date : 10-Jan-2019 16:29
Sample: -
Note : -
Inlet : Direct                         Ion Mode : FAB+
RT : 4.67 min                          Scan#: 57
Elements : C 110/1, H 130/1, O 8/1
Mass Tolerance       : 100ppm, 3mmu if m/z > 30
Unsaturation (U.S.)  : 0.0 - 30.0

Observed m/z Int%   Err[ppm / mmu]    U.S.  Composition
  383.1149   100.0     +4.8 /  +1.9   12.5  C 21 H 19 O 7
```

Figure S7. FABMS and HRFABMS data of compound **1**.

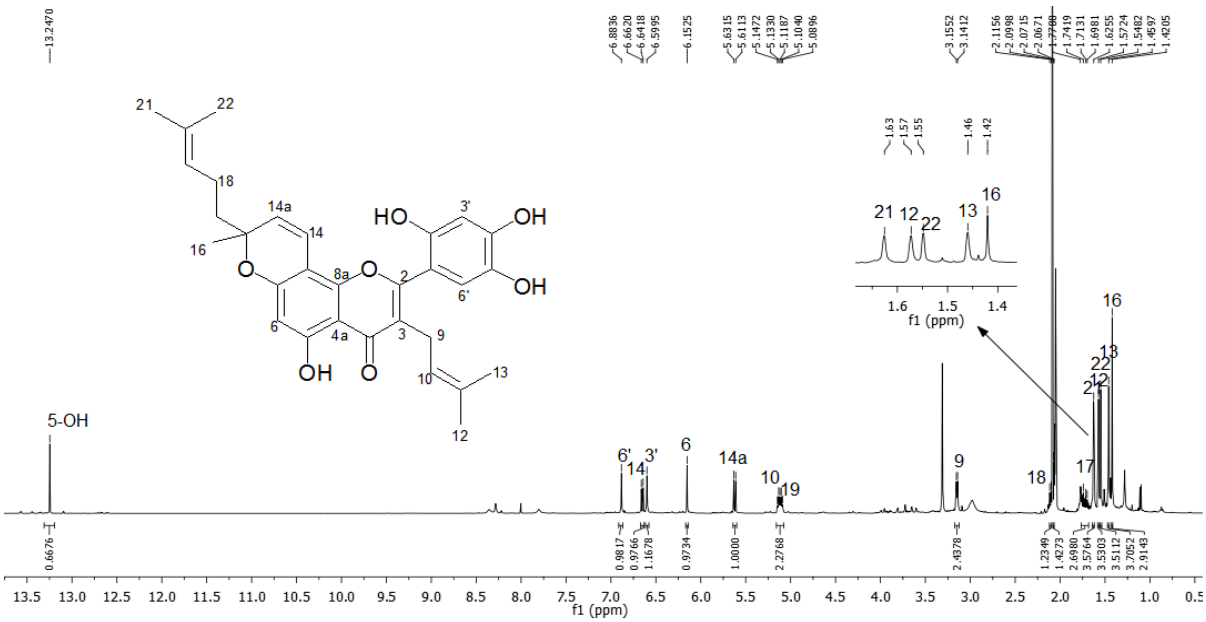


Figure S8. ^{1}H-NMR spectrum of compound **5** (500mHz, acetone-d_6)

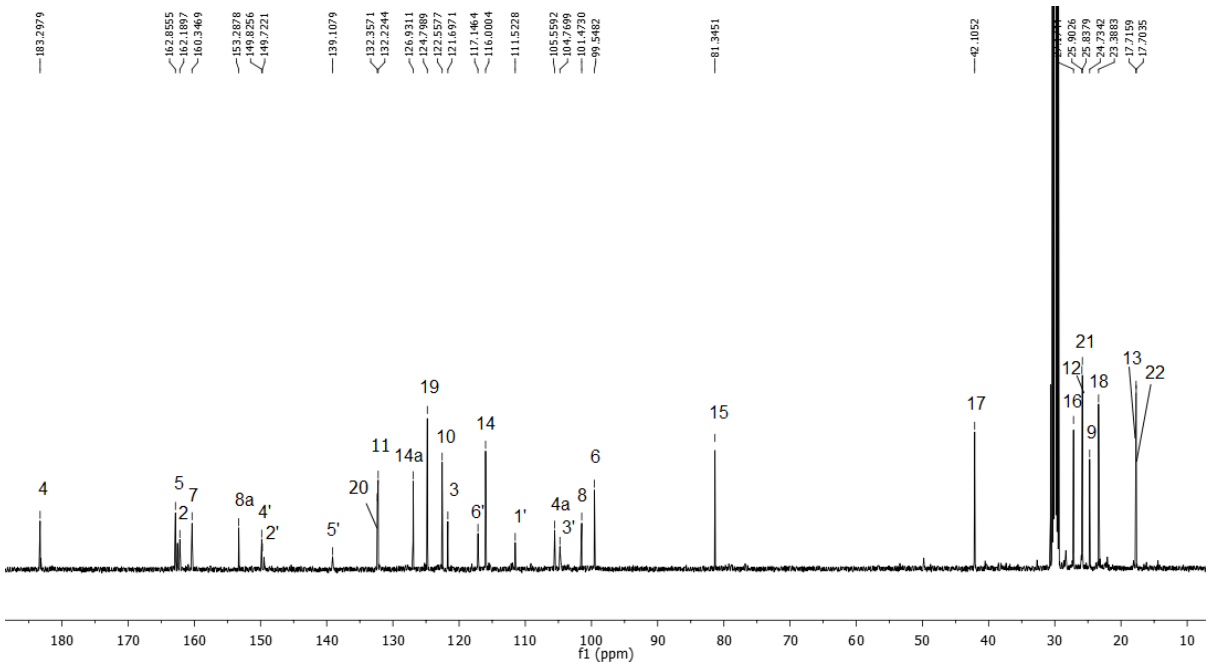


Figure S9. ^{13}C-NMR spectrum of compound **5** (125mHz, acetone-d_6)

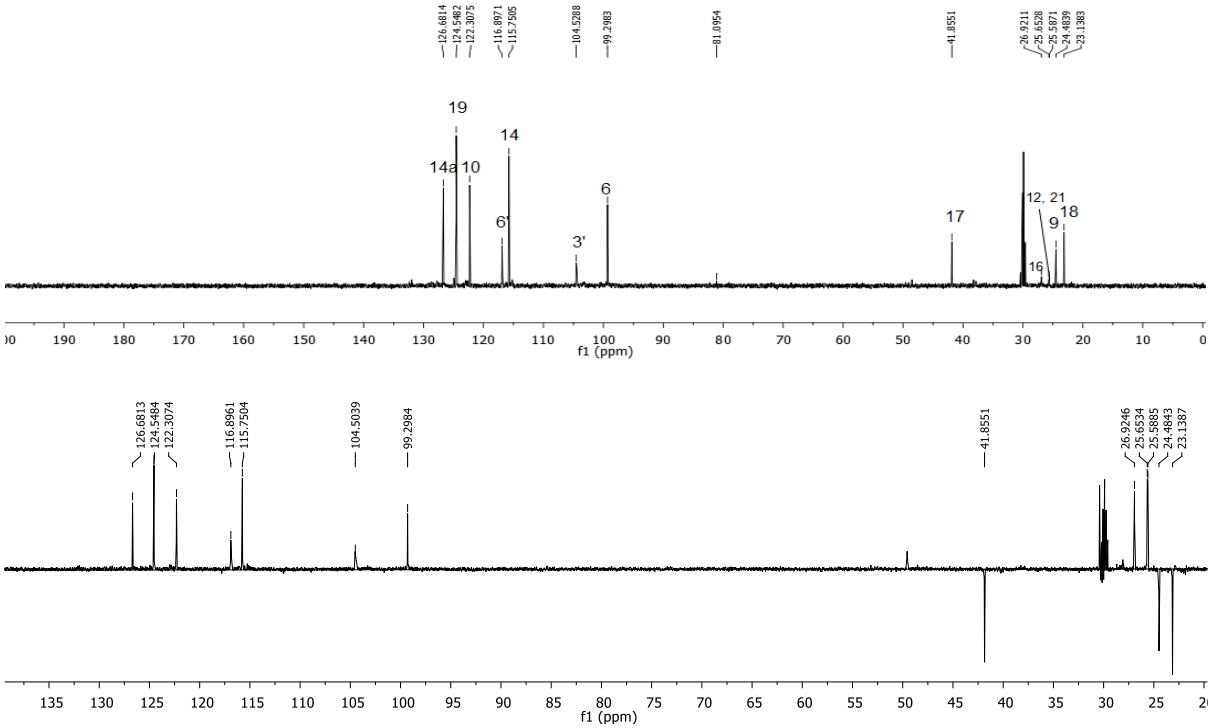


Figure S10. DEPT135 spectrum of compound **5**.

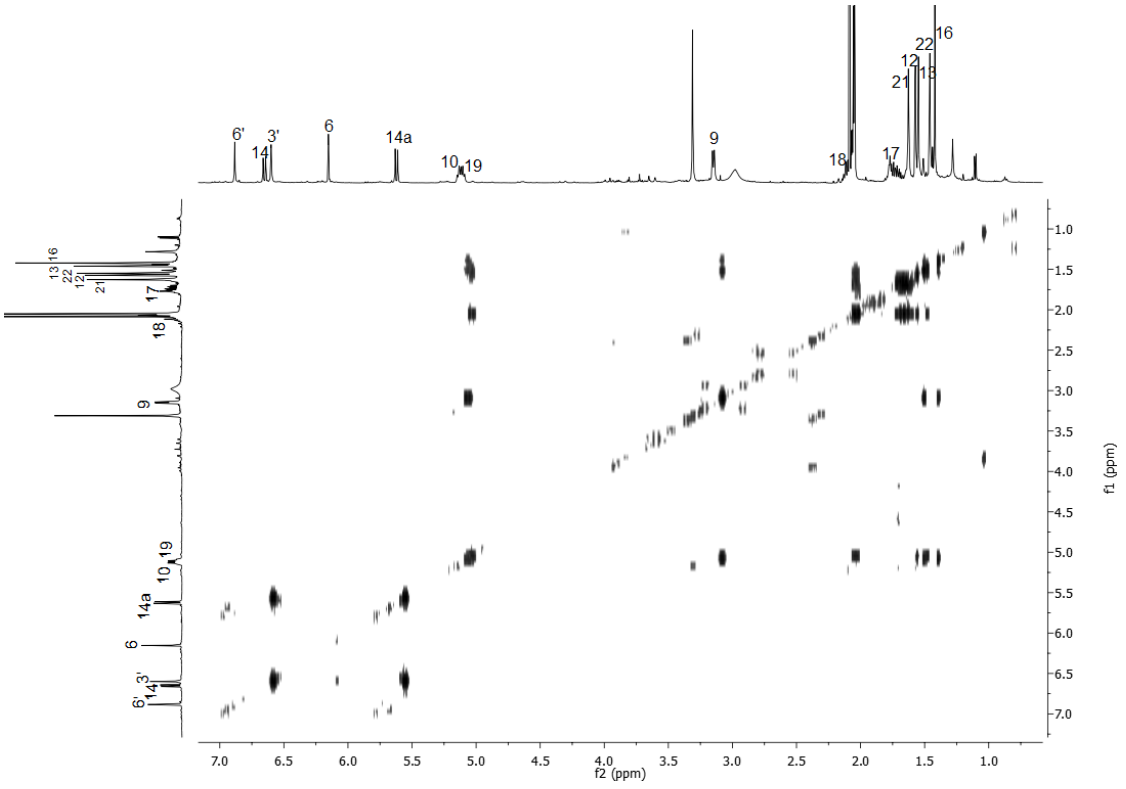


Figure S11. COSY spectrum of compound **5**.

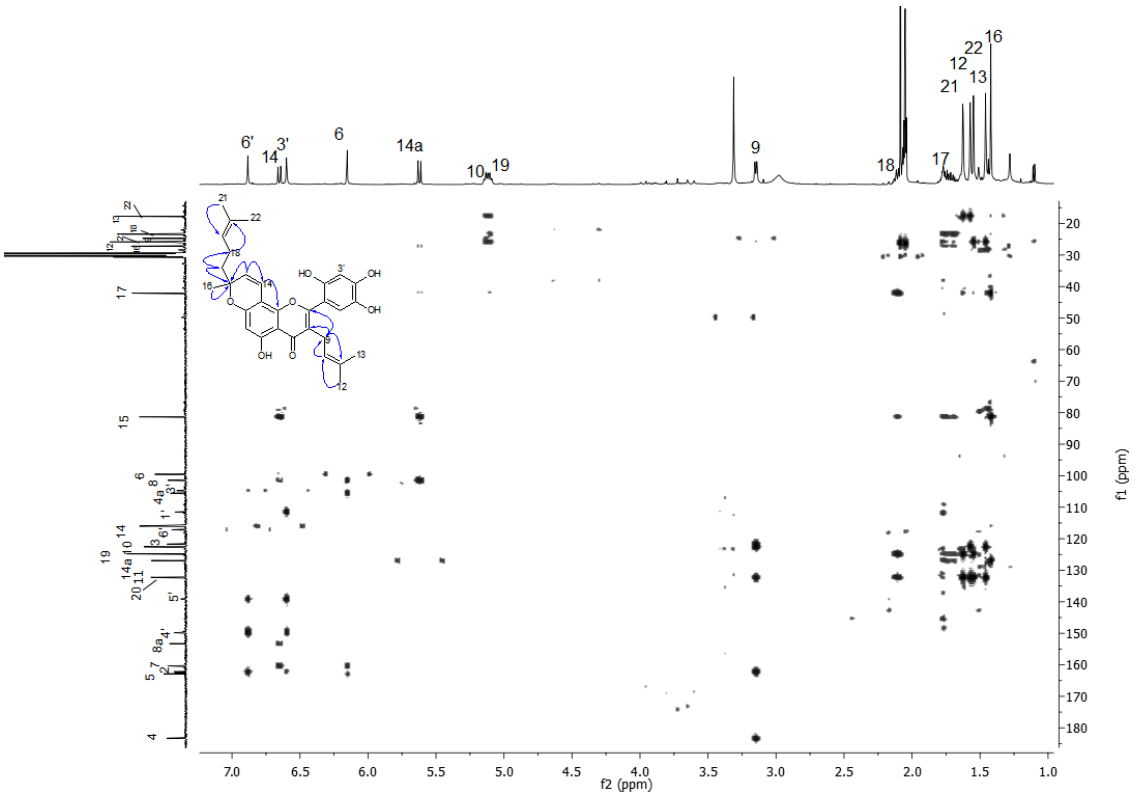


Figure S12. HMBC spectrum of compound **5**.

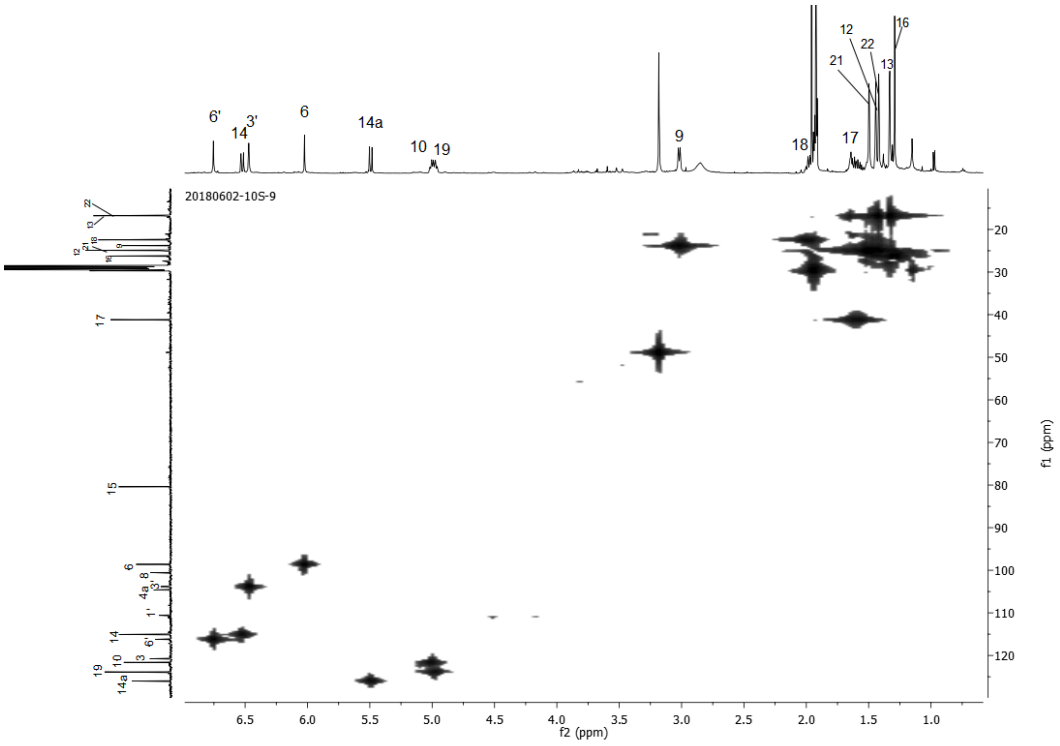
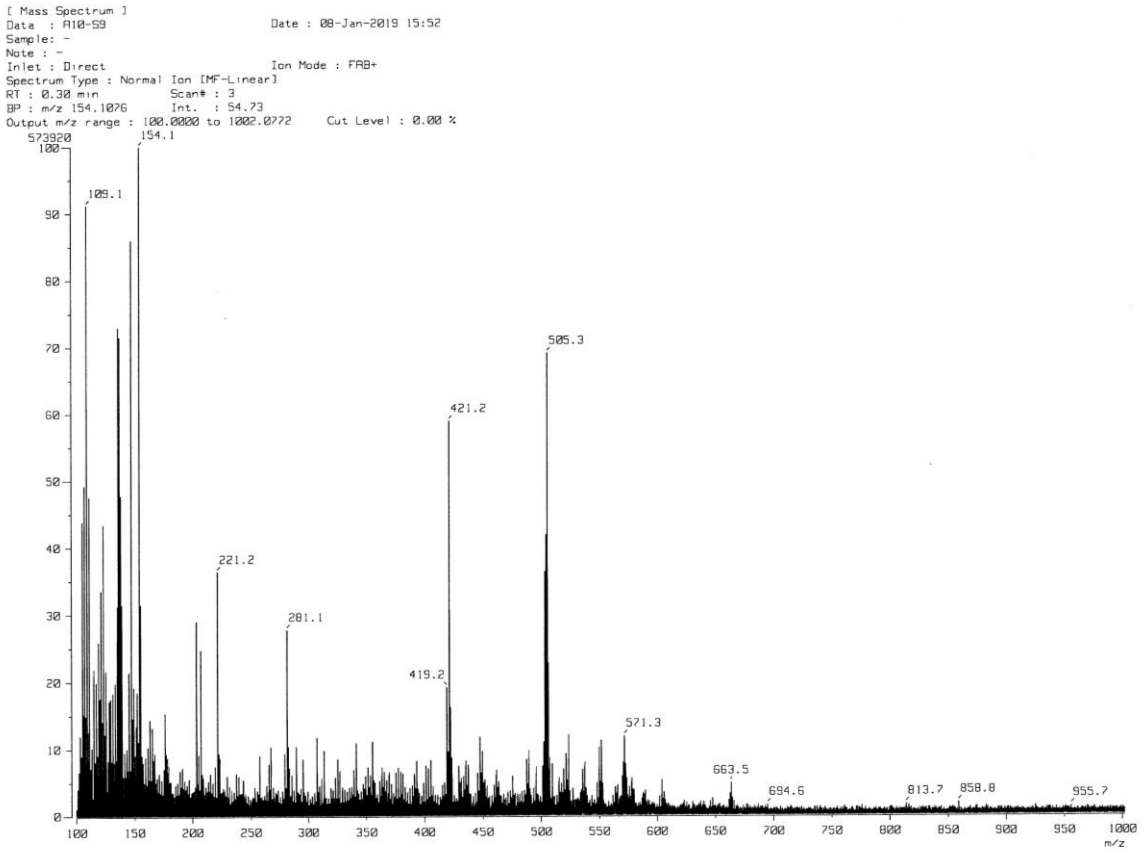


Figure S13.HMQC spectrum of compound **5**.




```
[ Elemental Composition ]
Data  : A10-S9_HR                    Date : 08-Jan-2019 17:31
Sample: -
Note : -
Inlet : Direct                       Ion Mode : FAB+
RT : 4.84 min                        Scan#: 59
Elements : C 110/1, H 130/1, O 8/1
Mass Tolerance      : 100ppm, 3mmu if m/z > 30
Unsaturation (U.S.) : 0.0 - 30.0

Observed m/z Int%   Err[ppm / mmu]    U.S.  Composition
  505.2216    34.6     -1.9 /  -1.0   14.5  C 30 H 33 O 7
```

Figure S14. FABMS and HRFABMS data of compound **5**.

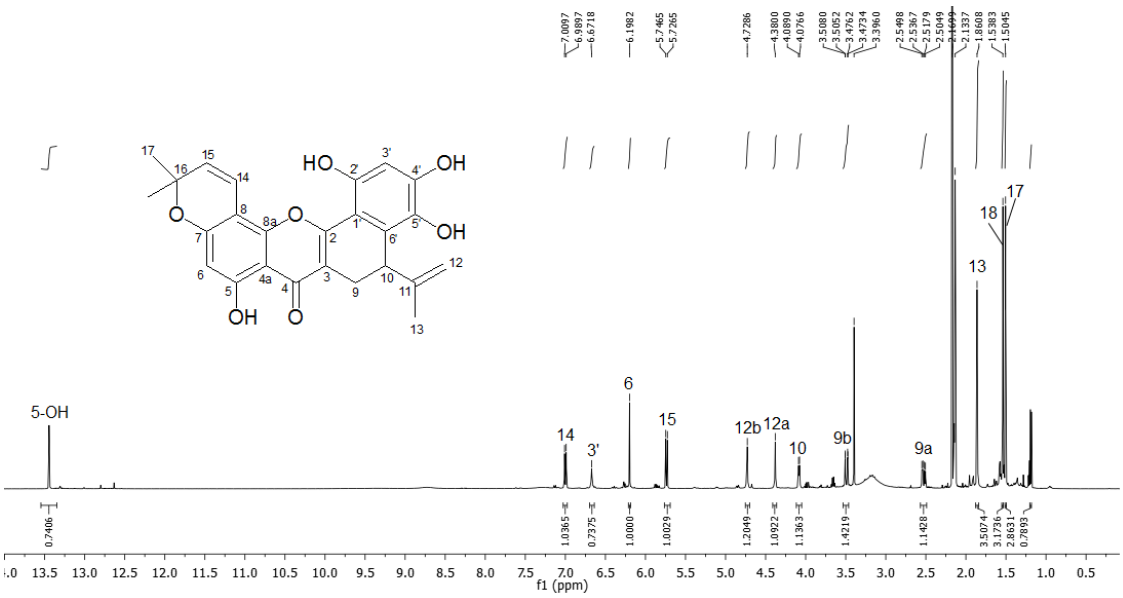


Figure S15. ^{1}H-NMR spectrum of compound **2** (500mHz, acetone-d_6)

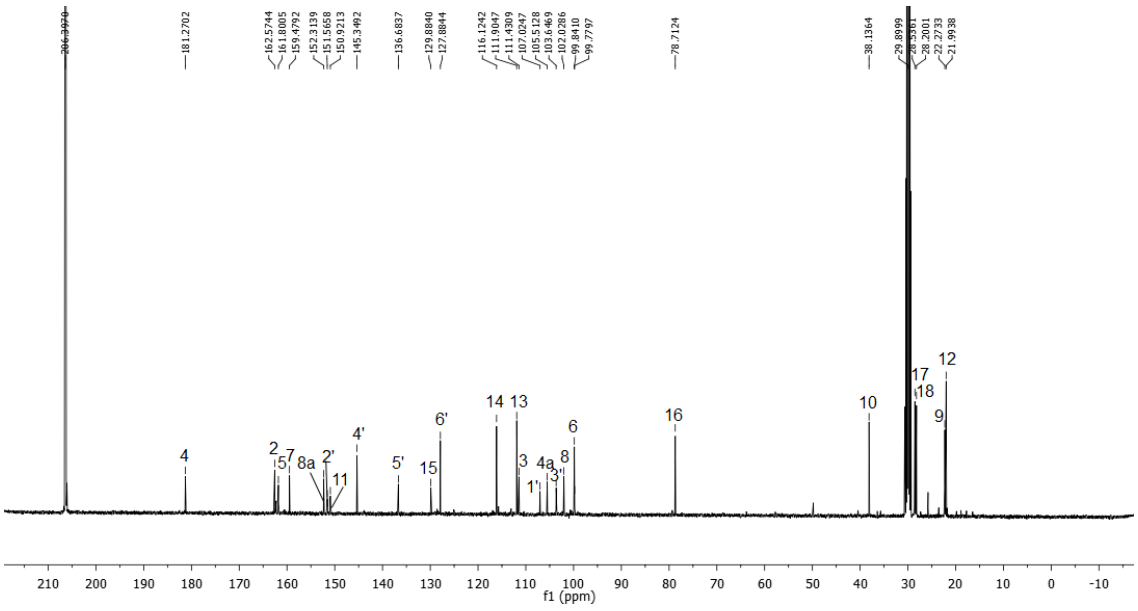


Figure S16. ^{13}C-NMR spectrum of compound **2** (125mHz, acetone-d_6)

Data : A-F2_HR Date : 19-Jun-2018 14:03
Instrument : MStation
Sample : –
Note : –
Inlet : Direct Ion Mode : EI+
RT : 1.80 min Scan# : 28
Elements : C 100/1, H 100/1, O 10/1
Mass Tolerance : 1000ppm, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 – 20.0

	Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
1	434.1363	21.31	-0.6 / -0.3	15.0	C25 H22 O7

Figure S17. HR-ESI-MS data of compound **2**.

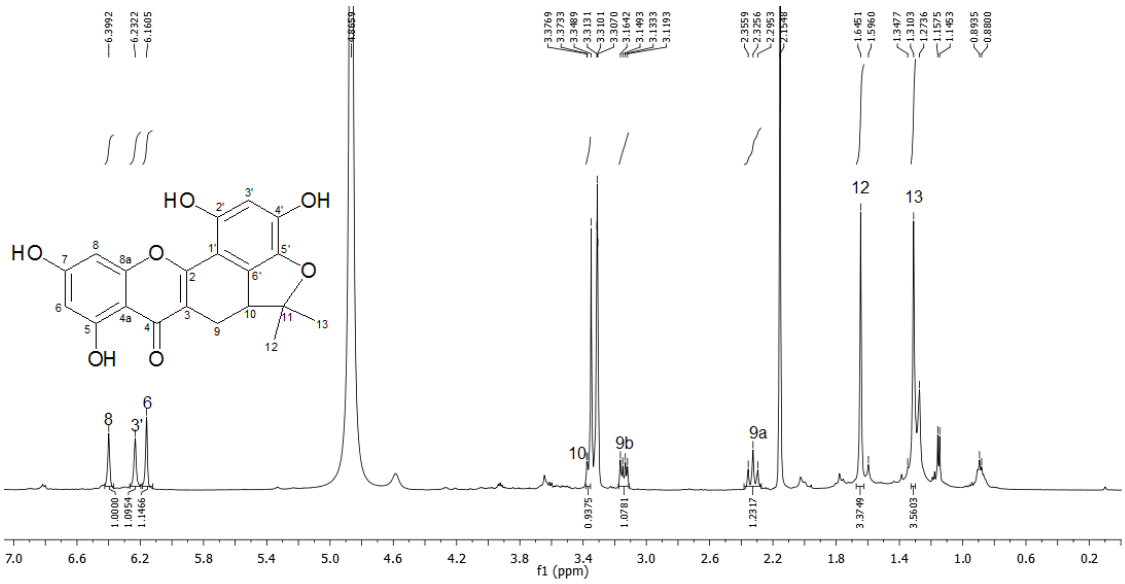


Figure S18. ^{1}H-NMR spectrum of compound **3** (500mHz, acetone-d_6)

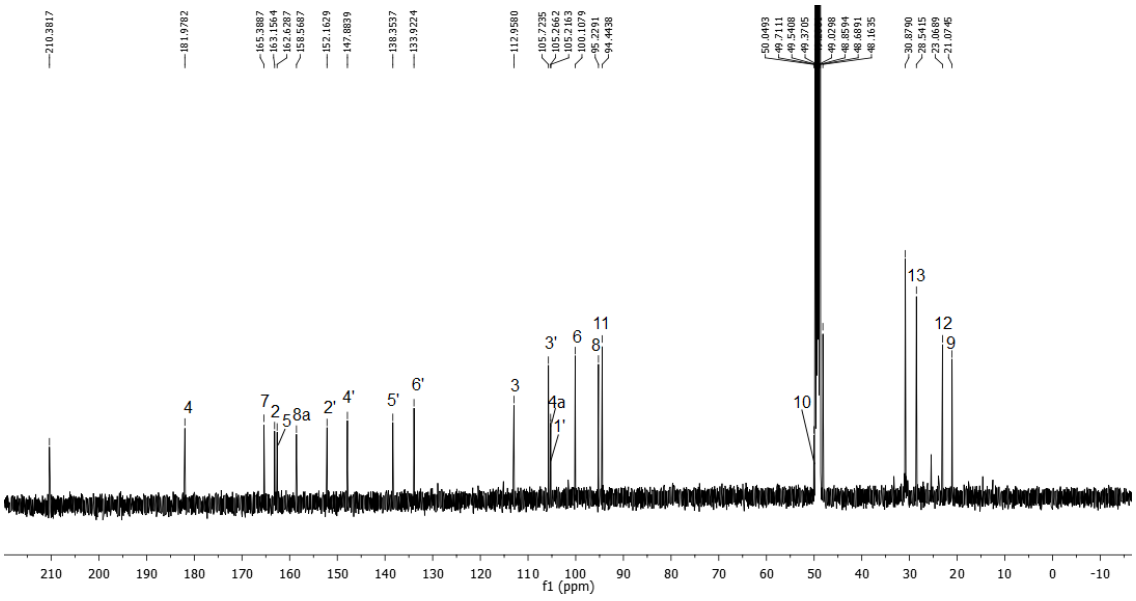


Figure S19. ^{13}C-NMR spectrum of compound **3** (125mHz, acetone-d_6)

Data : F3-4_HR Date : 19-Jun-2018 15:31
Instrument : MStation
Sample : –
Note : –
Inlet : Direct Ion Mode : EI+
RT : 1.94 min Scan# : 30
Elements : C 100/1, H 100/1, O 10/1
Mass Tolerance : 1000ppm, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 – 20.0

	Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
1	368.0899	21.53	+0.8 / +0.3	13.0	C20 H16 O7

Figure S20. HR-ESI-MS data of compound **3**.

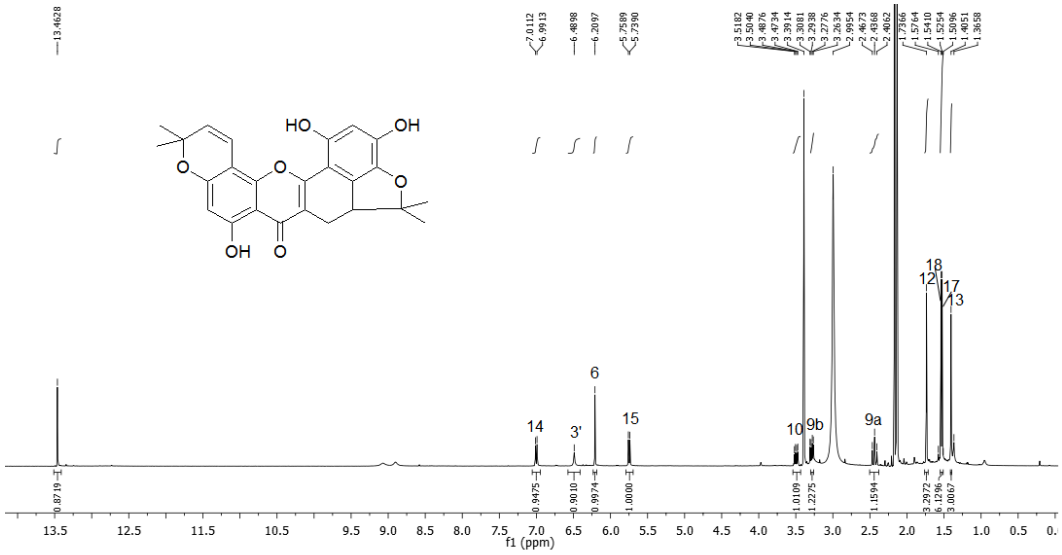


Figure S21. ^{1}H-NMR spectrum of compound **4** (500mHz, acetone-d_6)

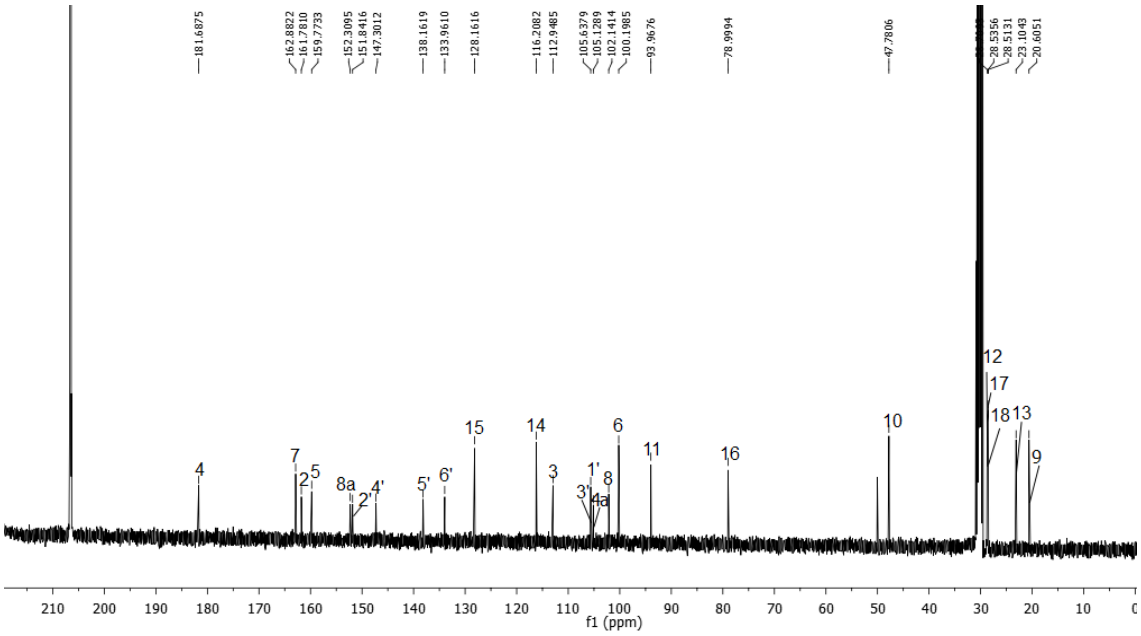


Figure S22. ^{13}C-NMR spectrum of compound **4** (125mHz, acetone-d_6)

Data : F11_HR Date : 19-Jun-2018 14:15
Instrument : MStation
Sample : -
Note : -
Inlet : Direct Ion Mode : EI+
RT : 3.14 min Scan# : 48
Elements : C 100/1, H 100/1, O 10/1
Mass Tolerance : 1000ppm, 3mmu if m/z > 3
Unsaturation (U.S.) : -0.5 - 20.0

	Observed m/z	Int%	Err[ppm / mmu]	U.S.	Composition
1	434.1364	22.03	-0.4 / -0.2	15.0	C25 H22 O7

Figure S23. HR-ESI-MS data of compound **4**.

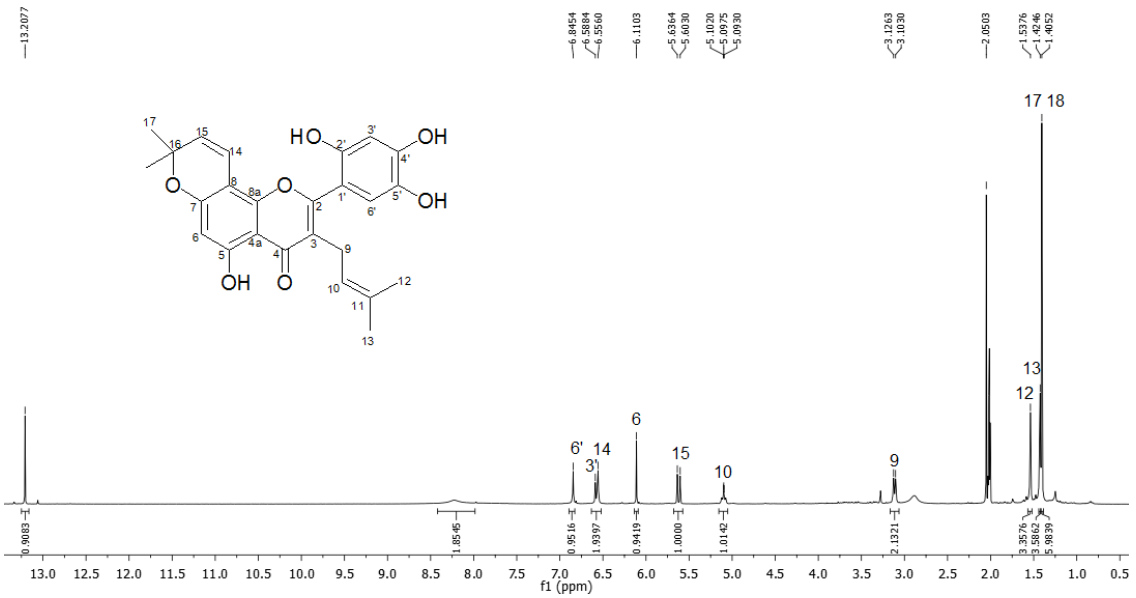


Figure S24. ^{1}H-NMR spectrum of compound **6** (500mHz, acetone-d_6)

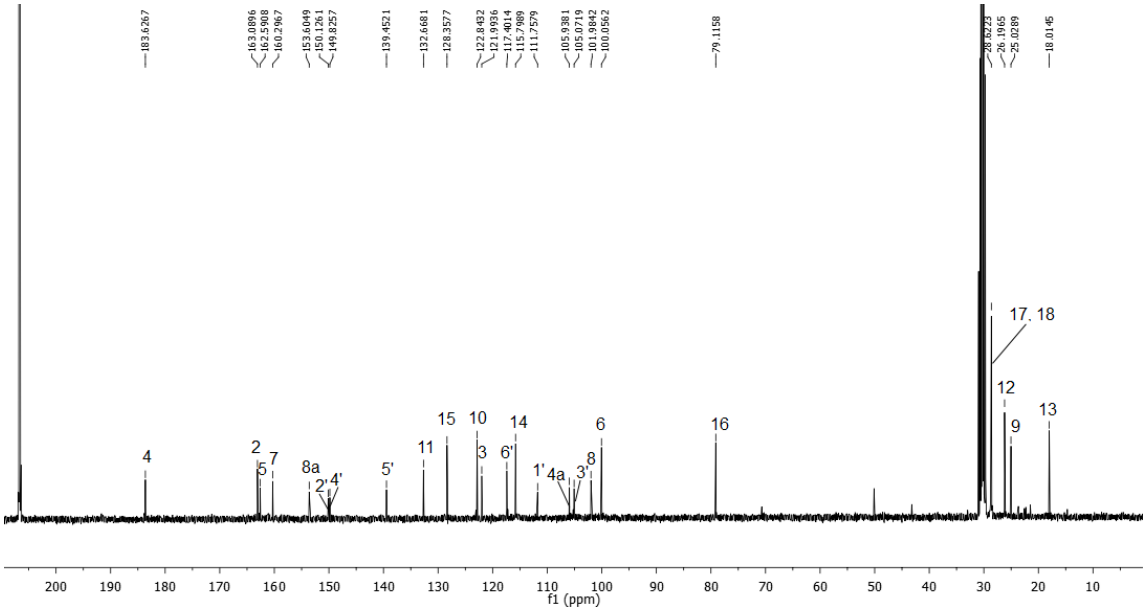


Figure S25. ^{13}C-NMR spectrum of compound **6** (125mHz, acetone-d_6)

```
[ Elemental Composition ]                                          P
Data  : A-F8_HR                        Date : 08-Jan-2019 17:22
Sample: -
Note : -
Inlet : Direct                         Ion Mode : FAB+
RT : 0.59 min                          Scan#: 8
Elements : C 110/1, H 130/1, O 8/1
Mass Tolerance      : 100ppm, 5mmu if m/z > 50
Unsaturation (U.S.) : 0.0 - 30.0

Observed m/z Int%   Err[ppm / mmu]    U.S.  Composition
  437.1635    20.4     +7.8 /  +3.4   13.5  C 25 H 25 O 7
```

Figure S26. HR-ESI-MS data of compound **6**.

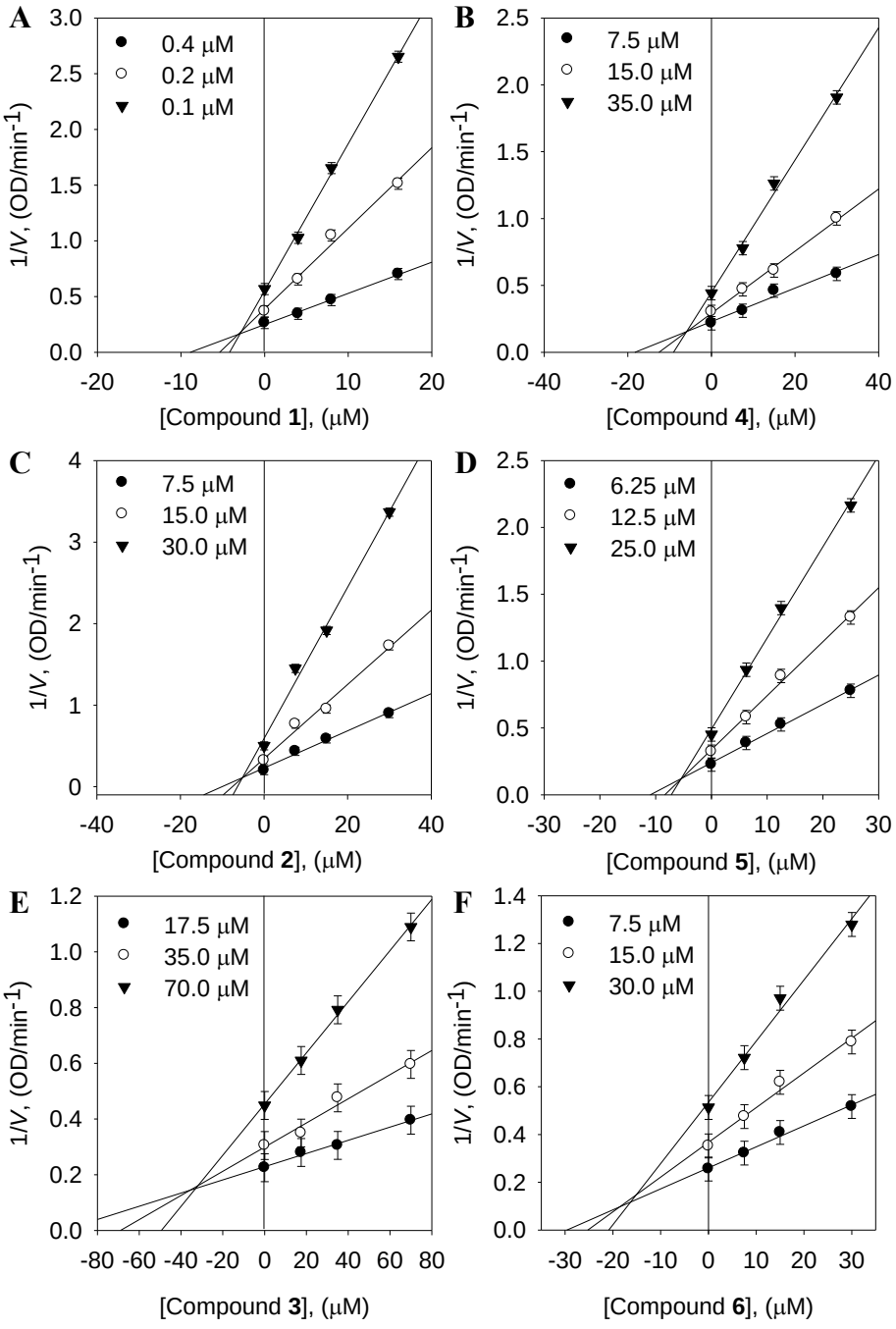


Figure S27. Dixon plots for α-glucosidase of compounds **1**-**6**.

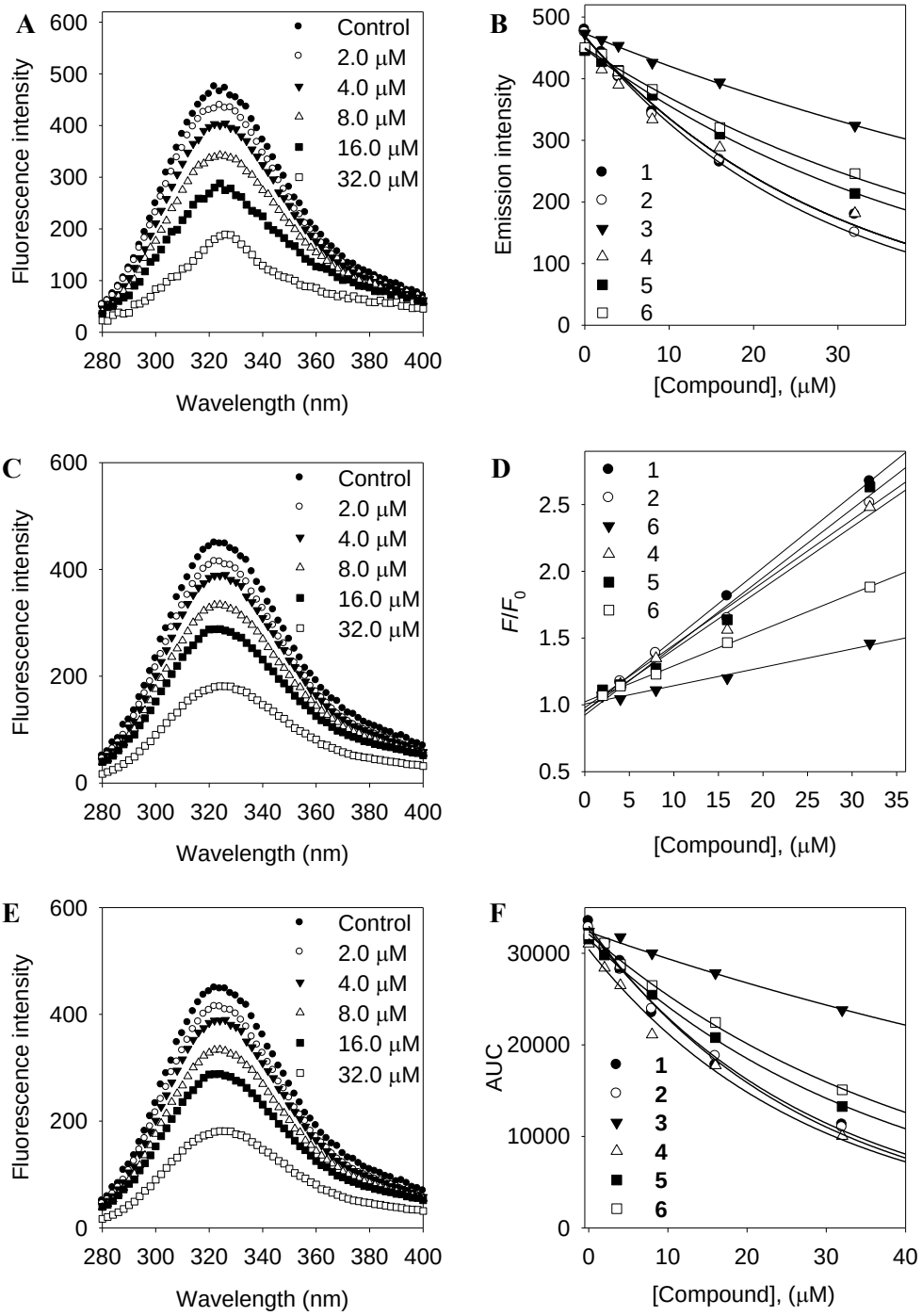


Figure S28. (A) The fluorescence effect of compound **2**, (C) compound **4** and (E) compound **5** on fluorescence emission spectra of α-glucosidase, (B) Decrease in intensity of the emission plots of compounds, (D) Stern-Volmer plots of compounds at 37 °C, (F) Area under curve (AUC) of compounds.

Figure S29. Amino acid sequence of *Saccharomyces cerevisiae* α-glucosidase. The Trp(W), Phe(F), and Tyr(Y) residues are shown as yellow, cyan, and pink respectively.

Trp(W): 20, Phe(F): 41, Tyr(Y): 26

Table S1. ^{1}H and ^{13}C spectroscopic data of (δ in ppm, J in Hz) **1** and **5** (acetone-d_6)

No.	**1**		**5**	
	δ_H J (Hz)	δ_C m	δ_H J (Hz)	δ_C m
2		161.9		162.2
3		111.7		121.7
4		181.1		183.3
4a		105.6		105.6
5		162.9		162.8
6	6.29 d (2.25)	98.7	6.15 s	99.6
7		166.1		160.4
8	6.65 d (2.25)	93.2		101.5
8a		157.7		153.2
9a	2.43 dd (15.98)	22.4	3.14 d (7)	24.7
9b	3.39 d (15.95)			
10	3.99 d (6.3)	38.0	5.09 m	122.6
11		145.4		132.2
12	1.78 s	22.0	1.57 s	25.9
13a	4.29 s	111.9	1.46 s	17.7
13b	4.65 s			
14			5.61 d (10.1)	116.0
14a			5.61 d (10.1)	126.9
15				81.4
16			1.42 s	27.2
17			1.69 m	42.1
18			2.07 m	23.4
19			5.09 m	124.8
20				132.4
21			1.63 s	25.8
22			1.54 s	17.7
1'		106.6		111.5
2'		151.4		149.7
3'	6.50 s	103.8	6.59 s	104.8
4'		151.2		149.8
5'		136.9		139.1
6'		129.4	6.88 s	117.2
OMe	3.89 s	56.4		

Table S2. Determination of K_{ik}/K_{iv} ratios by α-glucosidase enzyme inhibitory behaviours.

Compounds	[I] (μM)	V_{max}	K_m	K_{ik}/K_{iv}
2	0	9.337	186.0878	-
	7.5	9.7056	740.5780	76.6587
	15	9.6712	868.3559	102.4604
	30	9.8012	2117.5032	209.3396
3	0	6.5274	193.6945	-
	17.5	6.6800	301.7435	23.8593
	35	6.7889	439.0428	31.6240
	70	6.7204	627.7285	75.7804
4	0	6.8027	202.3061	-
	7.5	6.3816	397.2304	16.6987
	15	7.3692	812.0855	11.4837
	30	7.4627	1318.5821	20.2662
6	0	6.8013	194.8085	-
	7.5	5.0352	265.5740	3.7049
	15	4.2992	319.4798	2.5098
	30	3.6219	365.4835	1.8101