

Supplementary Materials

An Arylbenzofuran, Stilbene Dimers and Prenylated Diels-Alder Adducts as Potent Diabetic Inhibitors from *Morus bombycis* Leaves

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Table S1. Inhibitory activities of subfractions of EtOAc fraction from *Morus bombycis* leaves against peroxynitrite, α -glucosidase, PTP1B and AGE formation

Subfractions	Peroxyntirite IC₅₀ (μg/mL)^a	α-Glucosidase IC₅₀ (μg/mL)^a	PTP1B IC₅₀ (μg/mL)^a	BSA-AGEs IC₅₀ (μg/mL)^a
E2	1.23 ± 0.01	249.58 ± 18.53	56.93 ± 4.46	6.12 ± 0.29
E3	< 0.032	10.22 ± 2.29	25.11 ± 4.46	14.65 ± 1.50
E4	0.13 ± 0.02	5.11 ± 1.87	14.28 ± 5.46	4.19 ± 0.37
E6	0.34 ± 0.01	1.30 ± 0.08	4.65 ± 0.56	3.58 ± 0.24
E8	1.04 ± 0.09	0.77 ± 0.03	4.86 ± 1.40	4.60 ± 0.05
L-Penicillamine ^b	0.67 ± 0.01		5.60 ± 0.77	
Acarbose ^b		224.27 ± 4.82		
Ursolic acid ^b			6.39 ± 0.42	
Aminoguanidine ^b				36.73 ± 1.64

^aThe values are expressed as the mean ± SD of triplicate experiments. ^bPositive control was used in each assay

Table S2. The 1D NMR data of compounds 4 and 6

Macrourin B (4)			Austrafrican C (6)		
Position	H	C	Position	H	C
2		156.5	2		157.3
3	6.43 (br s, $J=0.15\text{Hz}$)	100.3	3	6.90 (1H, s)	102.1
3a		119.4	3a		124.1
4		121.6	4	7.07 (1H, s)	107.8
5		133.8	5		142.9
6		141.1	6		143.9
7	6.90 (s)	98.5	7	7.09 (1H, s)	99.8
7a		152.5	7a		151.2
8		146.2	1'		133.7
9	6.65 (d, $J=2\text{Hz}$)	103.8	2'	6.77 (d, $J=2.5\text{ Hz}$)	104
10		159.8	3'		160
11	6.19 (t, $J=3.2\text{Hz}$)	103.4	4'	6.25 (t, $J=2.3\text{ Hz}$)	103.7
12		159.8	5'		160
13	6.65 (d, $J=2\text{Hz}$)	103.8	6'	6.78 (d, $J=2.5\text{ Hz}$)	104
1'		119.5	1''		116
2'		157.5	2''		157.7
3'	6.33 (d, $J=2.5\text{Hz}$)	103.6	3''	6.18 (d, $J=2.3\text{ Hz}$)	103.4
4'		159.4	4''		159.7
5'	6.27 (dd, $J=8.4\text{Hz}$, 2.3Hz)	107.5	5''	6.27 (dd, $J=8.4\text{ Hz}$, 2.3 Hz)	108
6'	7.10 (d, $J=8.5\text{Hz}$)	129.3	6''	7.04 (d, $J=8.5\text{ Hz}$)	131
7'	5.78 (d, $J=7.5\text{Hz}$)	90.9	7''	5.23 (d, $J=8\text{Hz}$)	76.3
8'	4.74 (d, $J=7\text{Hz}$)	57	8''	5.07 (d, $J=7.6\text{Hz}$)	81
9'		145.9	9''		140.5
10'	6.23 (d, $J=2.5\text{Hz}$)	107.7	10''	6.22 (d, $J=2.3\text{Hz}$)	107.5
11'		159.5	11''		159
12'	6.17 (t, $J=4.6\text{Hz}$)	102.2	12''	6.13 (t, $J=2.3\text{ Hz}$)	103.4
13'		159.5	13''		159
14'	6.23 (d, $J=2.5\text{Hz}$)	107.7	14''	6.22 (d, $J=2.3\text{Hz}$)	107.5

Table S3. The 1D NMR data of compounds 7 and 8

Mulberrofuran F (7)			Chalcomoracin (8)		
Position	H	C	Position	H	C
2		155.4	2		156.4
3	6.91 (d, $J=1\text{Hz}$)	102.3	3	6.91 (d, $J=2\text{Hz}$, overlapping)	101.8
3a		123.1	3a		122.6
4	7.32 (d, $J=8.5\text{Hz}$)	122	4	7.34 (d, $J=8.5\text{Hz}$)	121.8
5	6.71 (dd, $J=8\text{Hz}$)	113.7	5	6.76 (m, overlapping)	113.1
6		156.9	6		157.8
7	6.88 (d, $J=1.7\text{Hz}$)	98.5	7	6.91 (d, $J=2\text{Hz}$, overlapping)	98.3
7a		156.9	7a		155.4
1'		131.5	1'		130.9
2'	6.87 (d, $J=3.4\text{Hz}$)	106	2'	6.76 (m, overlapping)	104.8
3'		154	3'		156.5
4'		113.3	4'		115.9
5'		158.3	5'		156.5
6'	(m, solvent overlapping)	105.2	6'	6.76 (m, overlapping)	104.9
1''		134.1	1''		133.8
2''	6.41 (br d, $J=5.5\text{Hz}$)	123	2''	5.77 (br s)	124.3
3''	(m, solvent overlapping)	35.9	3''	4.11 (br s)	33.1
4''	(m, solvent overlapping)	38	4''	4.63 (t, $J=4.20\text{ Hz}$)	47.8
5''	(m, solvent overlapping)	29.1	5''	3.75 (t, $J=5.7\text{ Hz}$)	36.5
6''	2.69 (dd, $J=15\text{Hz}$)	36.5	6''	2.18 (d, $J=18.5\text{Hz}$)	32.2
6b''	2.06 (dd, $J=15\text{Hz}$)		6b''	2.50 (d, $J=18\text{Hz}$)	32.2
7''	1.73 (s)	23.9	7''	1.93 (br s)	23.8
8''		104.2	8''		209.8
9''		ND	9''		113.4
10''		155.6	10''		164.6
11''		117.8	11''		116.6
12''		157.3	12''		164.2
13''	6.23 (d, $J=8.5\text{Hz}$)	107.4	13''	6.43 (d, $J=9\text{Hz}$)	108.1
14''	7.11 (d, $J=8.5\text{Hz}$)	128	14''	8.43 (d, $J=8.5\text{Hz}$)	132.1
15''		117.8	15''		121.9
16''		157.3	16''		156.6
17''	6.36 (1H, d, $J=2.5\text{Hz}$)	104.2	17''	6.50 (d, $J=2\text{Hz}$)	103.5
18''		157	18''		157.9
19''	6.46 (dd, $J=8.5\text{Hz}$)	110.5	19''	6.30 (dd, $J=8.4\text{Hz}$, 2.3Hz)	107.5
20''	7.00 (d, $J=9\text{Hz}$)	126.3	20''	7.00 (d, $J=8\text{Hz}$)	128.7
21''	2.99-2.95 (m)	23.2	21''	3.25 (d, $J=7.5\text{Hz}$)	22.2
22''	5.16 (m)	124.1	22''	5.14 (t, $J=7.25\text{Hz}$)	123.1
23''		131.9	23''		131.5
24''	1.80 (s)	25.9	24''	1.70 (s)	25.8
25''	1.56 (s)	17.9	25''	1.56 (s)	17.8

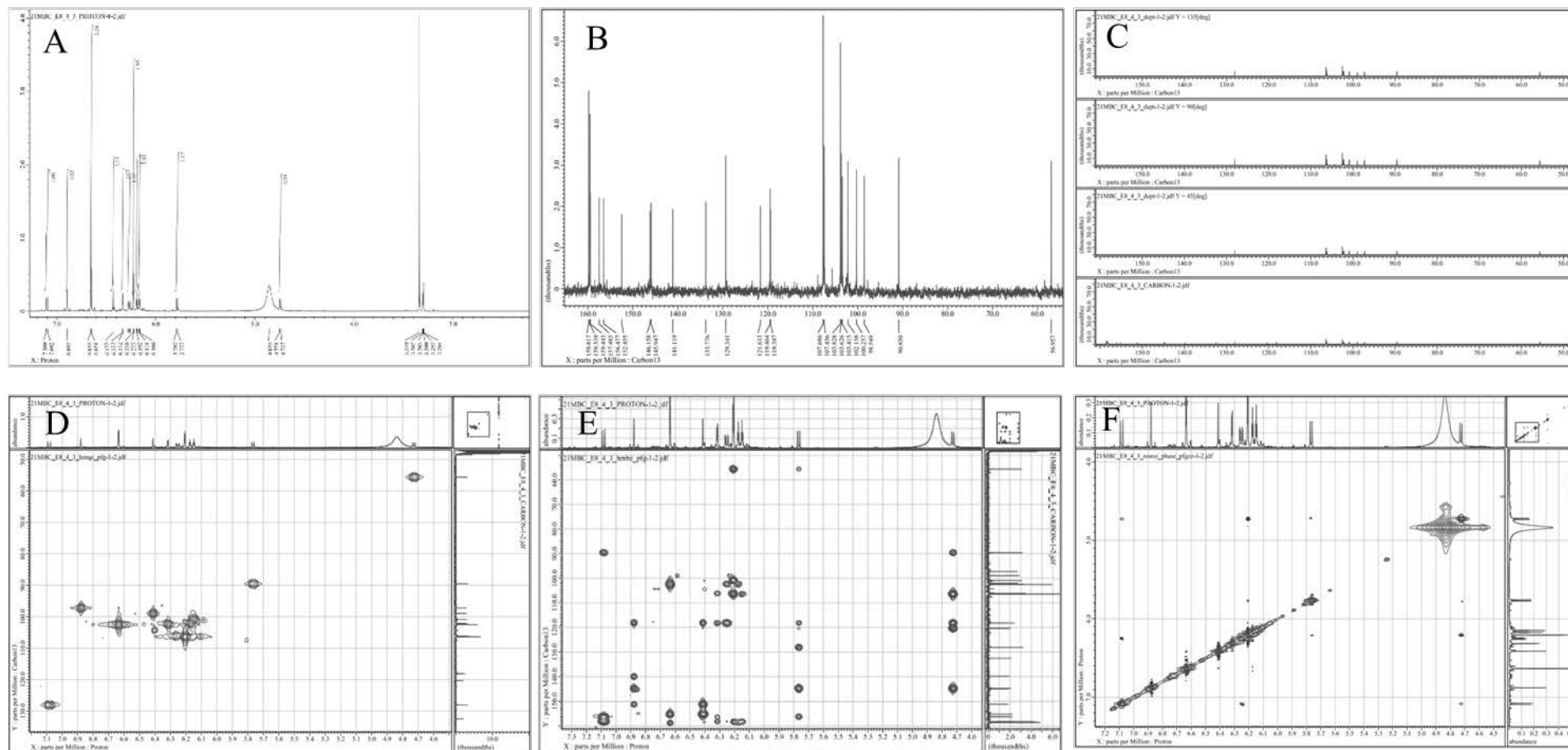


Figure S1. The NMR chromatograms of compounds 4

A: ^1H NMR; B: ^{13}C NMR; C: DEPT; D: HMQC; E: HMBC; F: NOESY (dissolved in MeOH- d_4)

Table S4. The 1D NMR data of compounds 1- 3

<i>p</i> -Coumaric acid (1)
¹ H NMR: (500 MHz, MeOH- <i>d</i> ₄) δ _H 7.52 (d, <i>J</i> = 16Hz, 1H, H-7), 7.41 (d, <i>J</i> = 8.5Hz, 2H, H-2, 6), 6.77 (d, <i>J</i> = 8.5Hz, 2H, H-3, 5), 6.29 (d, <i>J</i> = 16Hz, 1H, H-8); ¹³ C NMR: (125 MHz, MeOH- <i>d</i> ₄) δ _C 172.5 (C-9), 160.7 (C-4), 145.2 (C-7), 130.8 (C-2, 6), 127.2 (C-1), 117.6 (C-8), 116.7 (C-3, 5).
Chlorogenic acid methyl ester (2)
¹ H NMR: (500 MHz, MeOH- <i>d</i> ₄) δ _H 7.51 (d, <i>J</i> = 15.5Hz, 1H, H-7'), 7.03 (d, <i>J</i> = 1.9Hz, 1H, H-2'), 6.94 (dd, <i>J</i> = 10.3Hz, 1H, H-6'), 6.77 (d, <i>J</i> = 8Hz, 1H, H-5'), 6.21 (d, <i>J</i> = 16Hz, 1H, H-8'), 5.27 (dd, <i>J</i> = 11.3Hz, 1H, H-3), 4.12 (br d, 1H, H-5), 3.72 (dd, <i>J</i> = 7.6Hz, 1H, H-4), 3.68 (s, 3H, COOCH ₃), 2.20 (dd, <i>J</i> = 13.5Hz, 1H, H-2a), 2.16 (m, 2H, H-2b, 6a), 2.00 (br d, <i>J</i> = 13.5Hz, 1H, H-6b); ¹³ C NMR: (125 MHz, MeOH- <i>d</i> ₄) δ _C 174.1 (C-7), 167 (C-9'), 148.4 (C-4'), 145.9 (C-7'), 145.5 (C-3'), 126.3 (C-1'), 121.6 (C-6'), 115.2 (C-5'), 113.8 (C-2'), 113.7 (C-8'), 74.5 (C-1), 71.2 (C-4), 70.8 (C-3), 69 (C-5), 51.6 (OCH ₃), 36.7 (C-6a, 6b), 36.4 (C-2a, 2b).
Oxyresveratrol (3)
¹ H NMR (500 MHz, MeOH- <i>d</i> ₄) δ _H 7.32 (d, <i>J</i> = 9Hz, 1H, H-6), 7.26 (d, <i>J</i> = 16Hz, 1H, H-β), 6.80 (d, <i>J</i> = 16.5Hz, 1H, H-α), 6.44 (d, <i>J</i> = 2Hz, 2H, H-2', 6'), 6.31-6.29 (m, 2H, H-3, 5), 6.13 (t, <i>J</i> = 2Hz, 1H, H-4'); ¹³ C NMR: (125 MHz, MeOH- <i>d</i> ₄) δ _C 158.2 (C-5', 3'), 157.9 (C-4), 156 (C-2), 140.9 (C-1') 127.1 (C-6), 125.3 (C-β), 123.6 (C-α), 116.5 (C-1), 107.1 (C-5), 104.3 (C-2', 6'), 102.2 (C-3), 101 (C-4').