

Supporting Information

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A New Iridoid Glucoside from the Stems of *Myoporum bontioides*

A. Gray Growing in Vietnam

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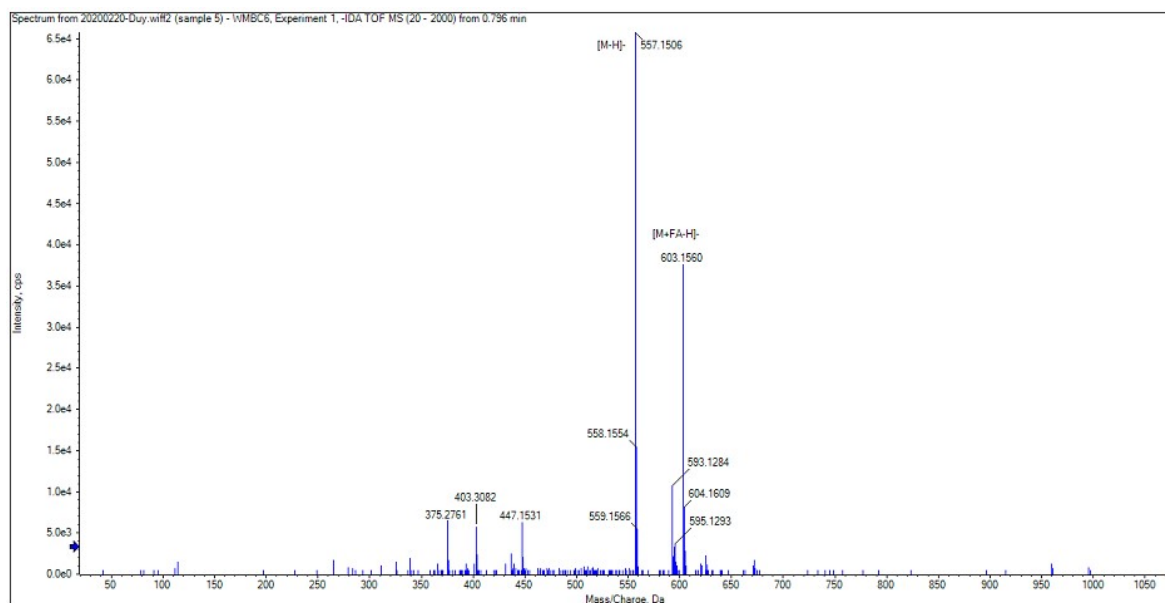


Figure S1: HR-ESI Mass Spectrum of Myobontioside E (1)

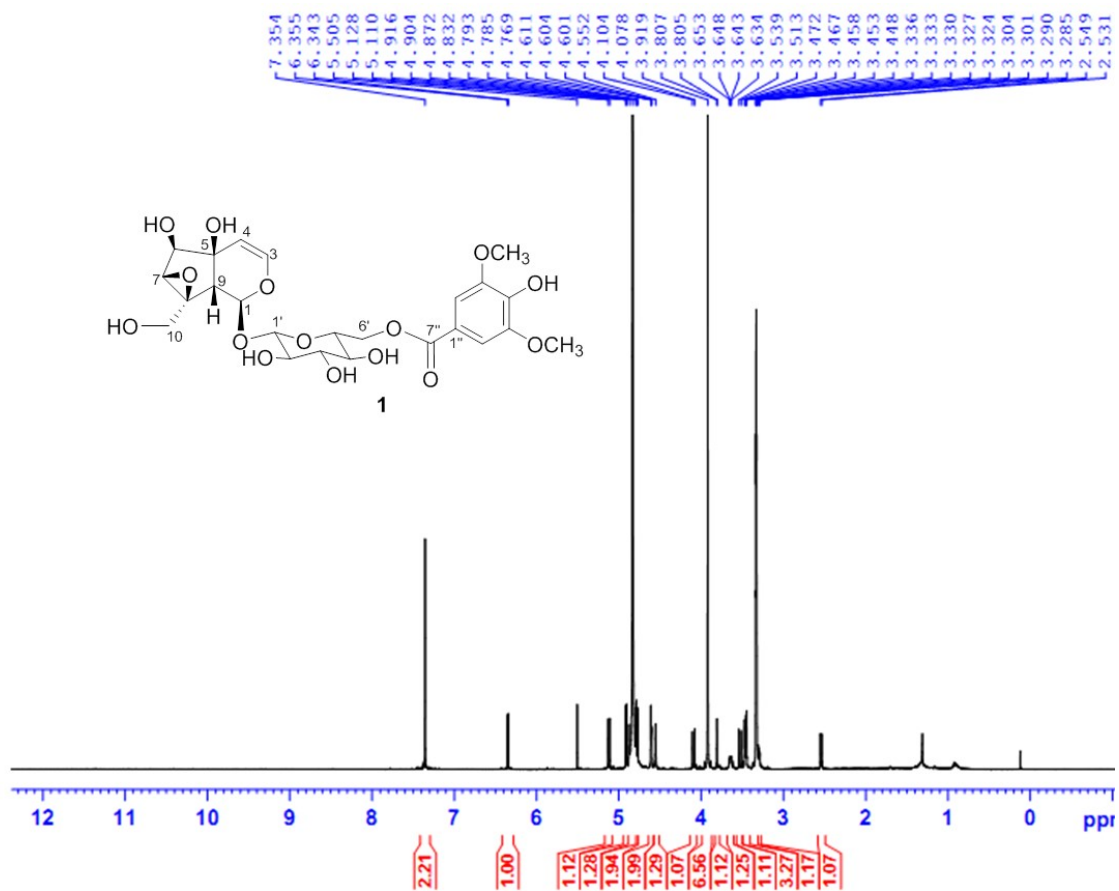


Figure S2: ¹H-NMR (500 MHz, CD₃OD) Spectrum of Myobontioside E (1)

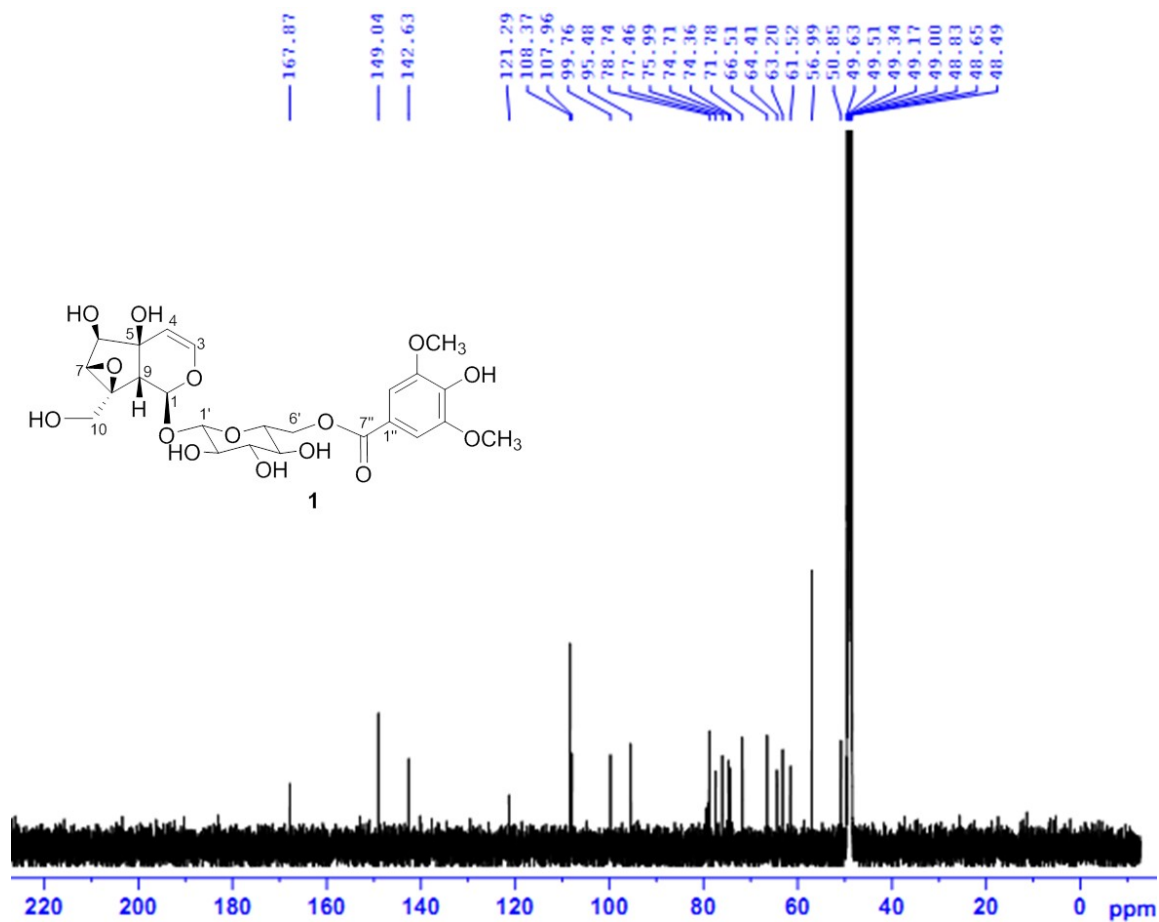


Figure S3: ¹³C-NMR (125 MHz, CD₃OD) Spectrum of Myobontioside E (1)

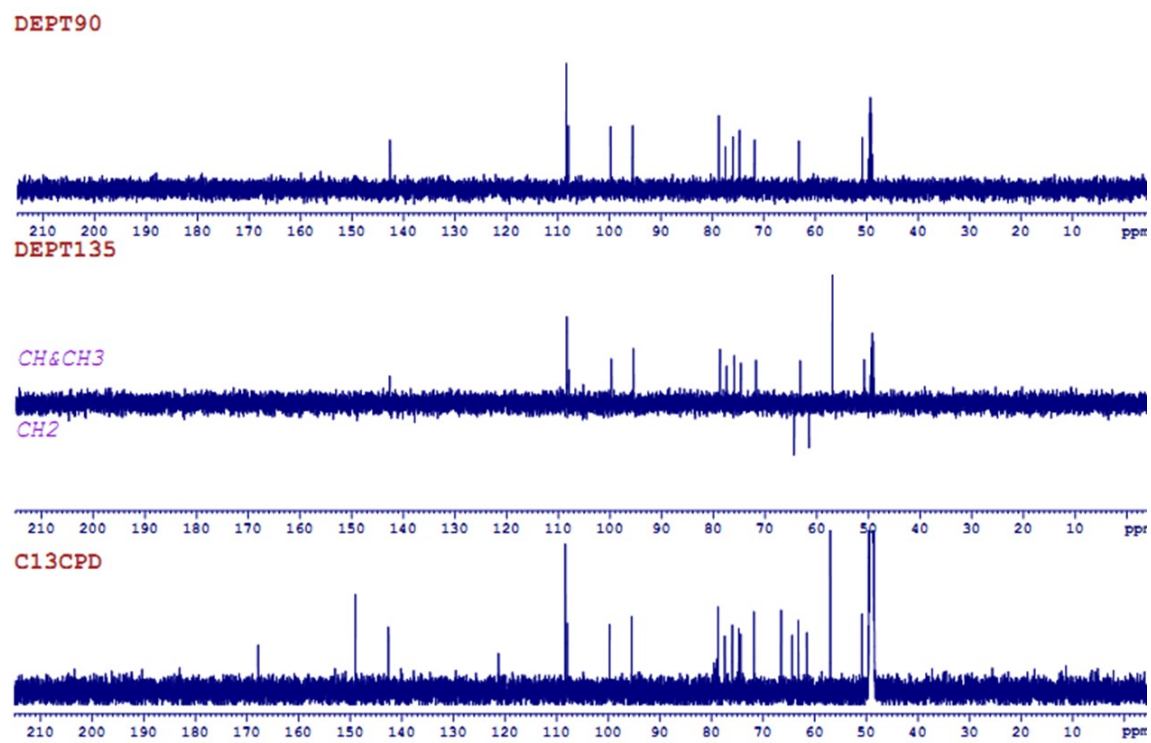


Figure S4: DEPT90 and 135 (125 MHz, CD₃OD) Spectrum of Myobontioside E (1)

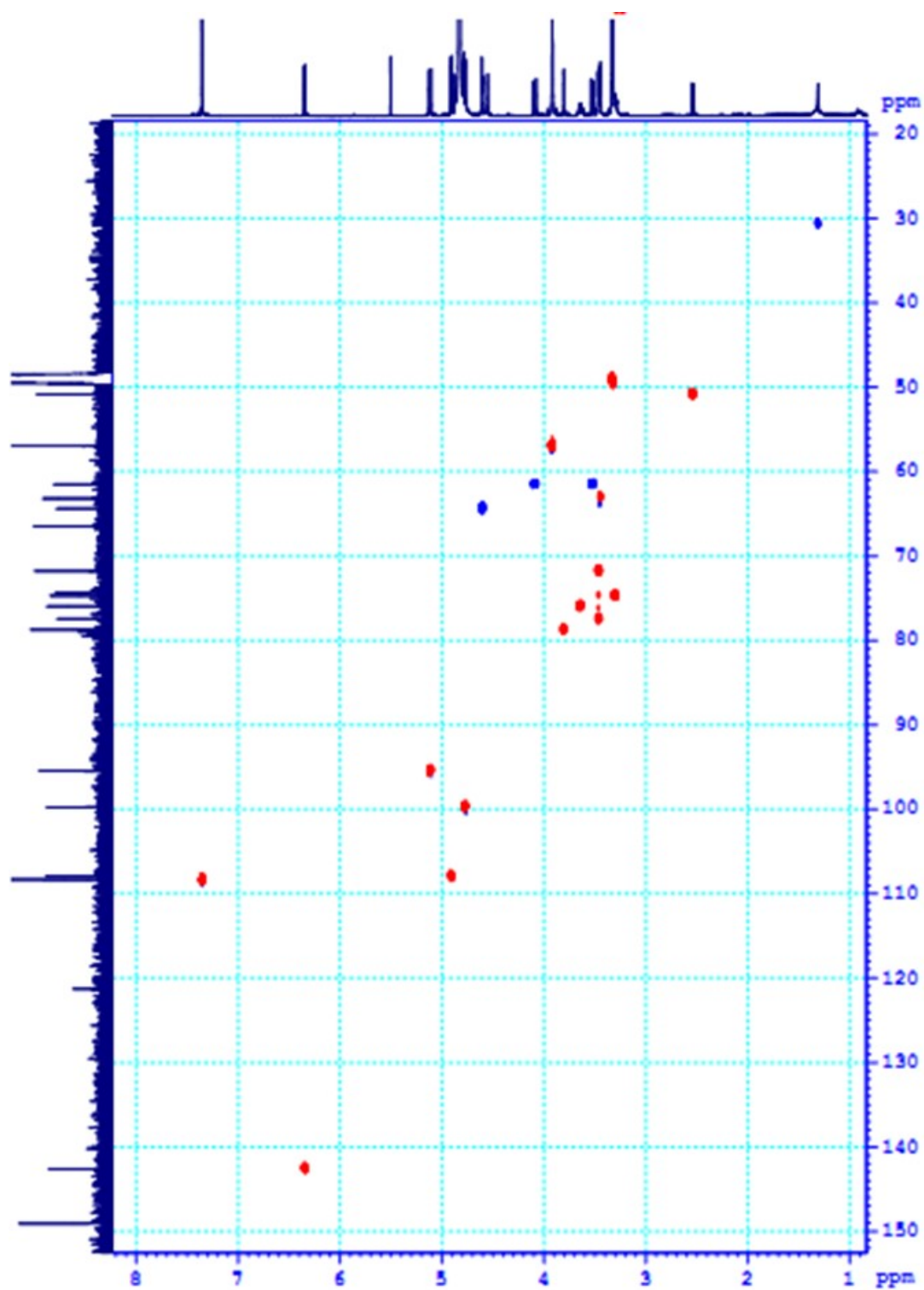


Figure S5: HSQC Spectrum of Myobontioside E (1)

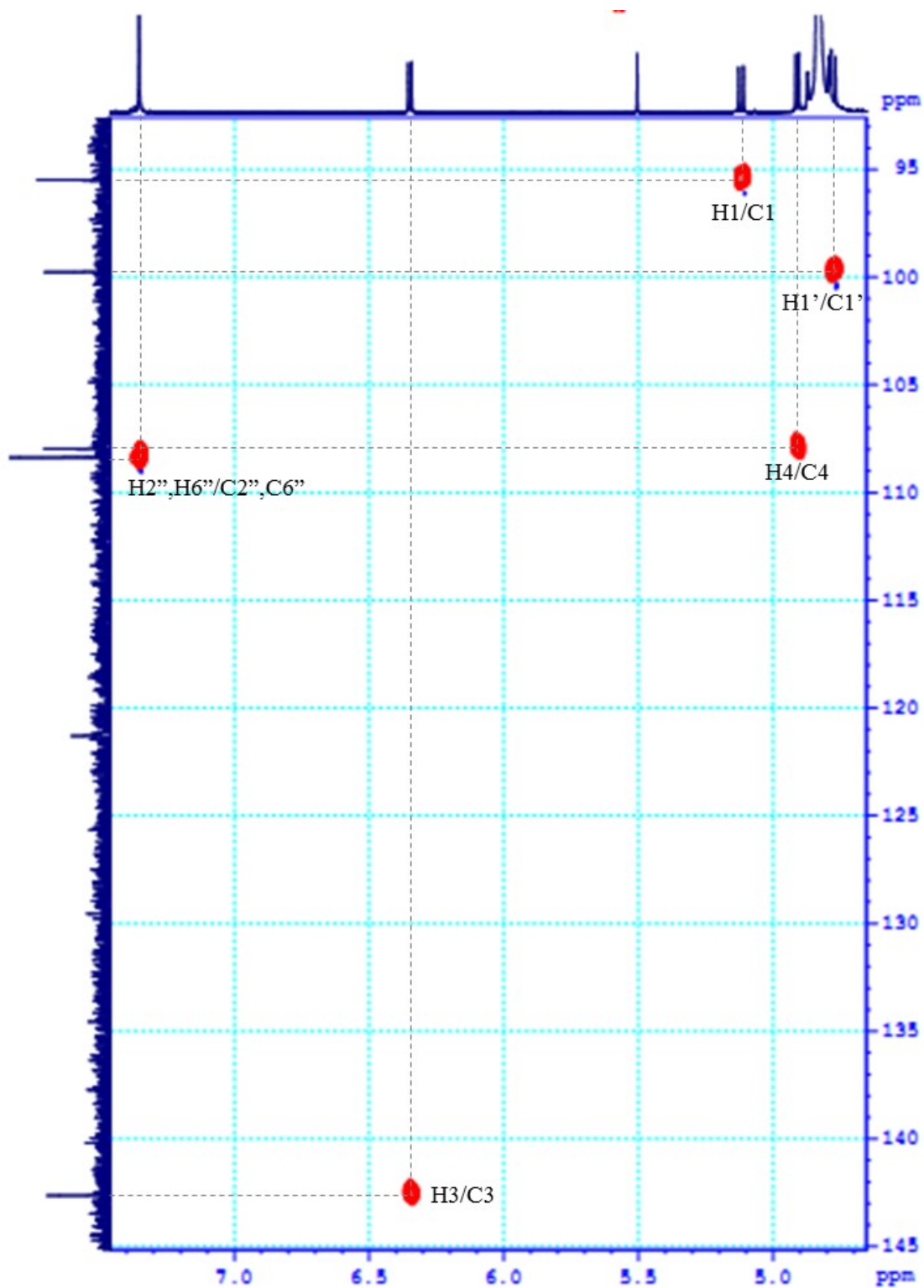


Figure S6: HSQC Spectrum of Myobontioside E (1) (From δ_c 95 ppm to δ_c 145 ppm)

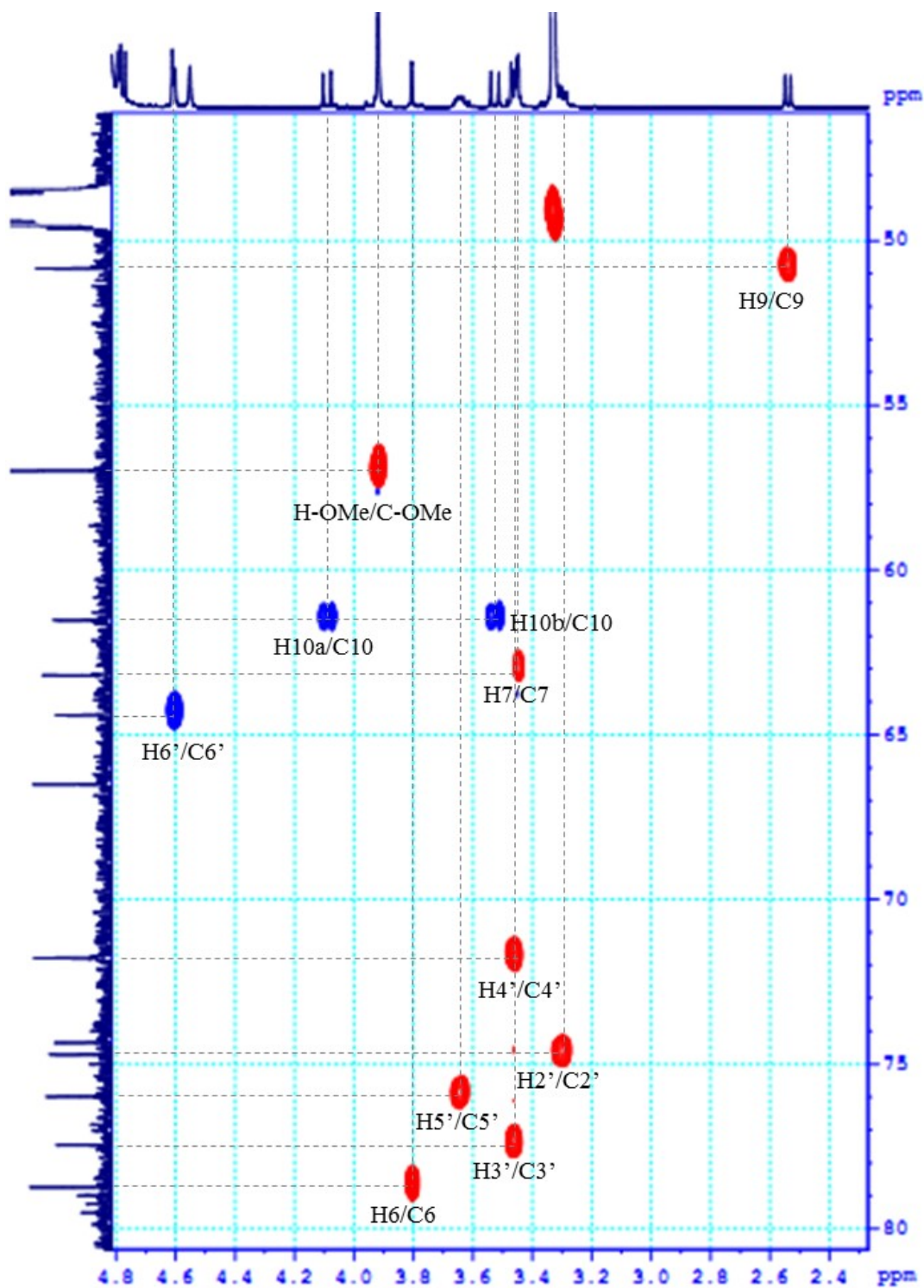


Figure S7: HSQC Spectrum of Myobontioside E (1) (From δ_{C} 45 ppm to δ_{C} 80 ppm)

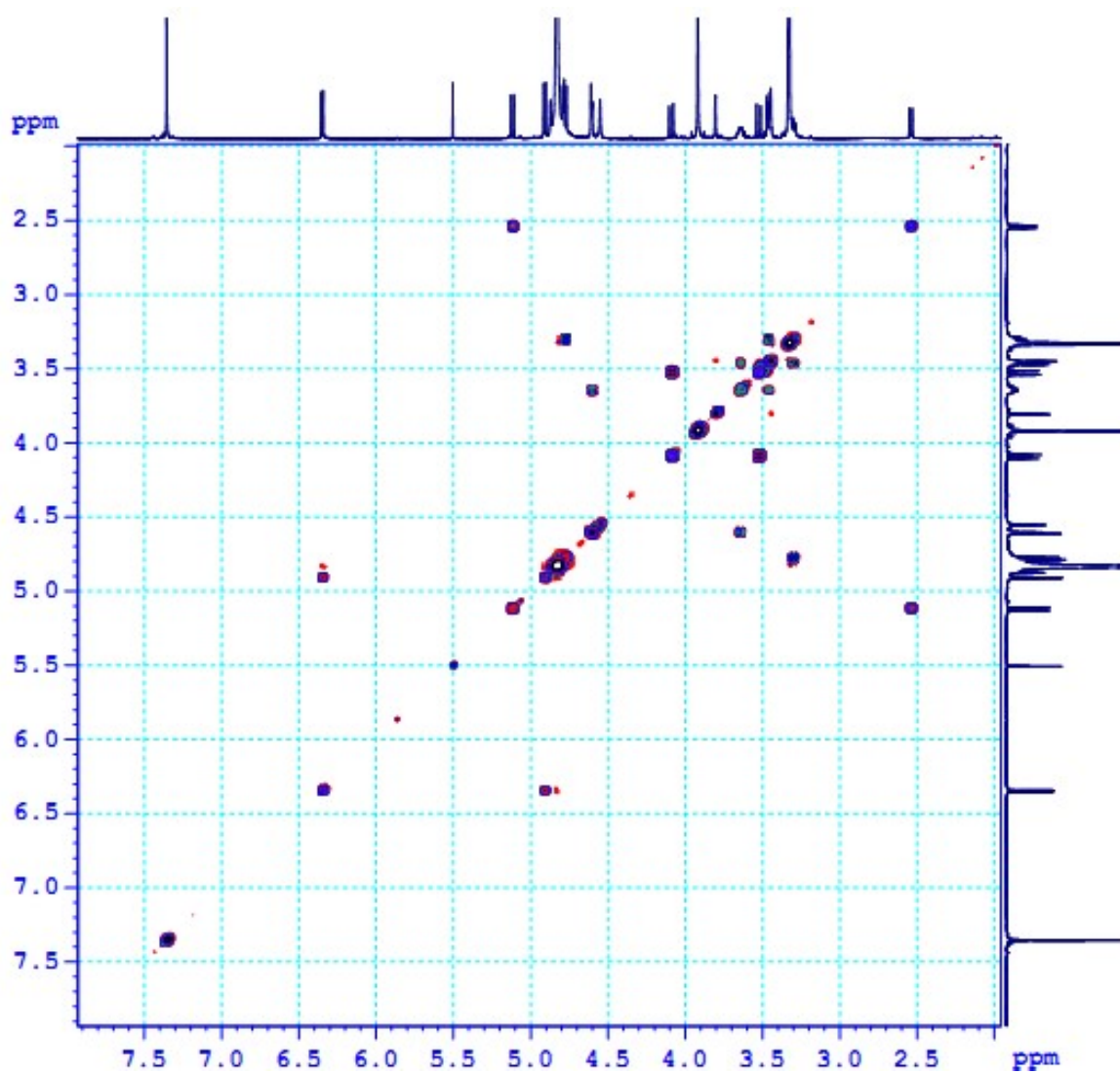


Figure S8: ^1H - ^1H COSY Spectrum of Myobontioside E (1)

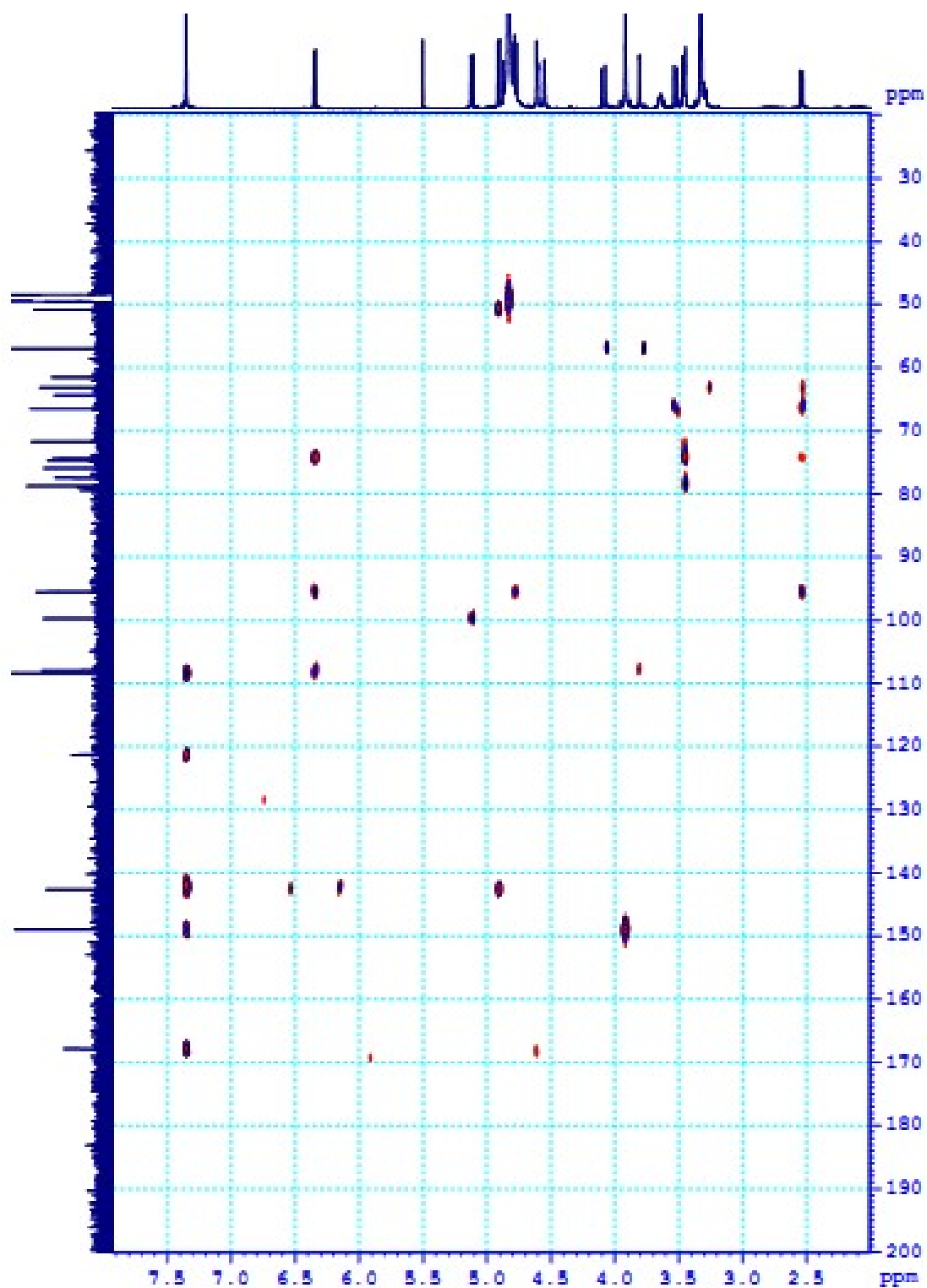


Figure S9: HMBC Spectrum of Myobontioside E (1)

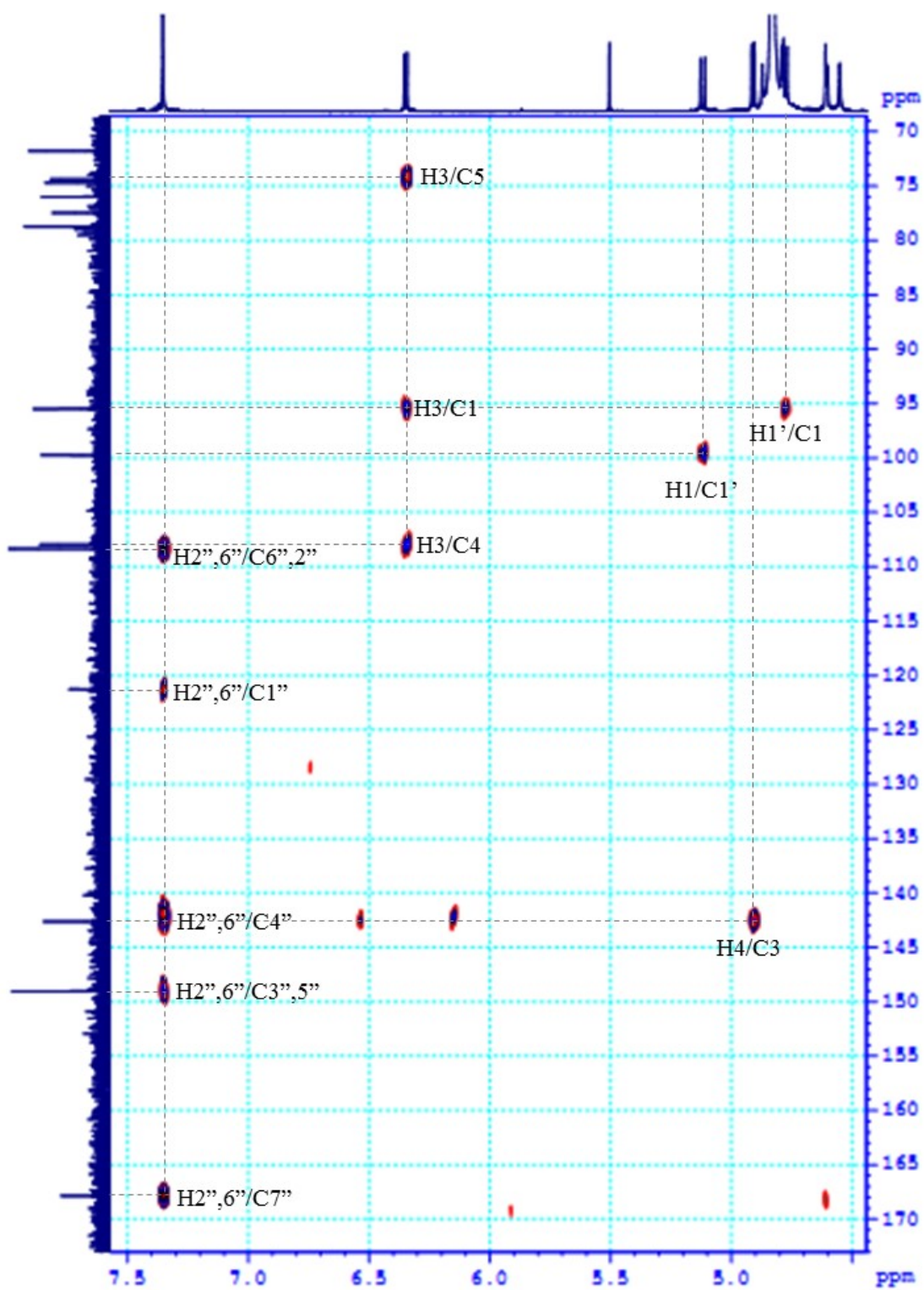


Figure S10: HMBC Spectrum of Myobontioside E (1) (From δ_c 70 ppm to δ_c 170 ppm)

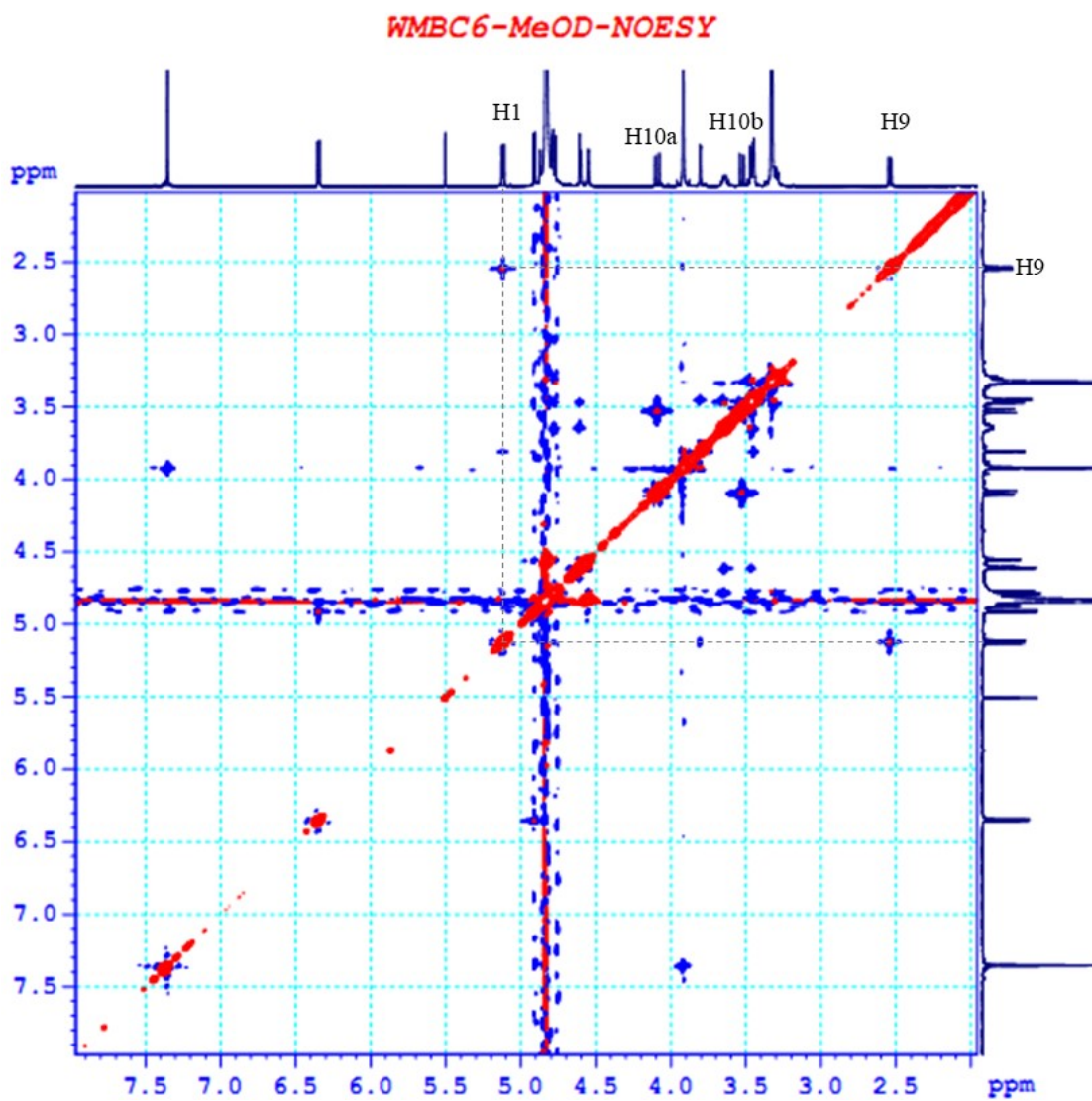


Figure S11: NOESY Spectrum of Myobontioside E (1)

Myopochlorin (2): ESI-MS (positive): $m/z = 273$ $[M + 2H_2O + H]^+$ ($C_9H_{14}O_5^{35}Cl$), 275 $[M + 2H_2O + H]^+$ ($C_9H_{14}O_5^{37}Cl$); 1H NMR (500 MHz, CD_3COCD_3) δ : 5.40 (1H, d, $J = 5.5$ Hz, H-1), 4.56 (1H, dd, $J = 1.5, 10.5$ Hz, H-7), 4.41 (1H, d, $J = 10.0$ Hz, H-10a), 3.78 (1H, dd, $J = 7.5, 10.5$ Hz, H-6), 3.72 (1H, td, $J = 2.0, 12.0$ Hz, H-3a), 3.62 (1H, ddd, $J = 2.5, 5.5, 12.0$ Hz, H-3b), 3.42 (1H, dd, $J = 1.5, 10.0$ Hz, H-10b), 2.20 (1H, d, $J = 6.0$ Hz, H-9), 1.86 (1H, dt, $J = 2.0, 13.5$ Hz, H-4a), 1.61 (1H, td, $J = 5.5, 13.5$ Hz, H-4b); ^{13}C NMR (125 Hz, CD_3COCD_3) data (Table S2).

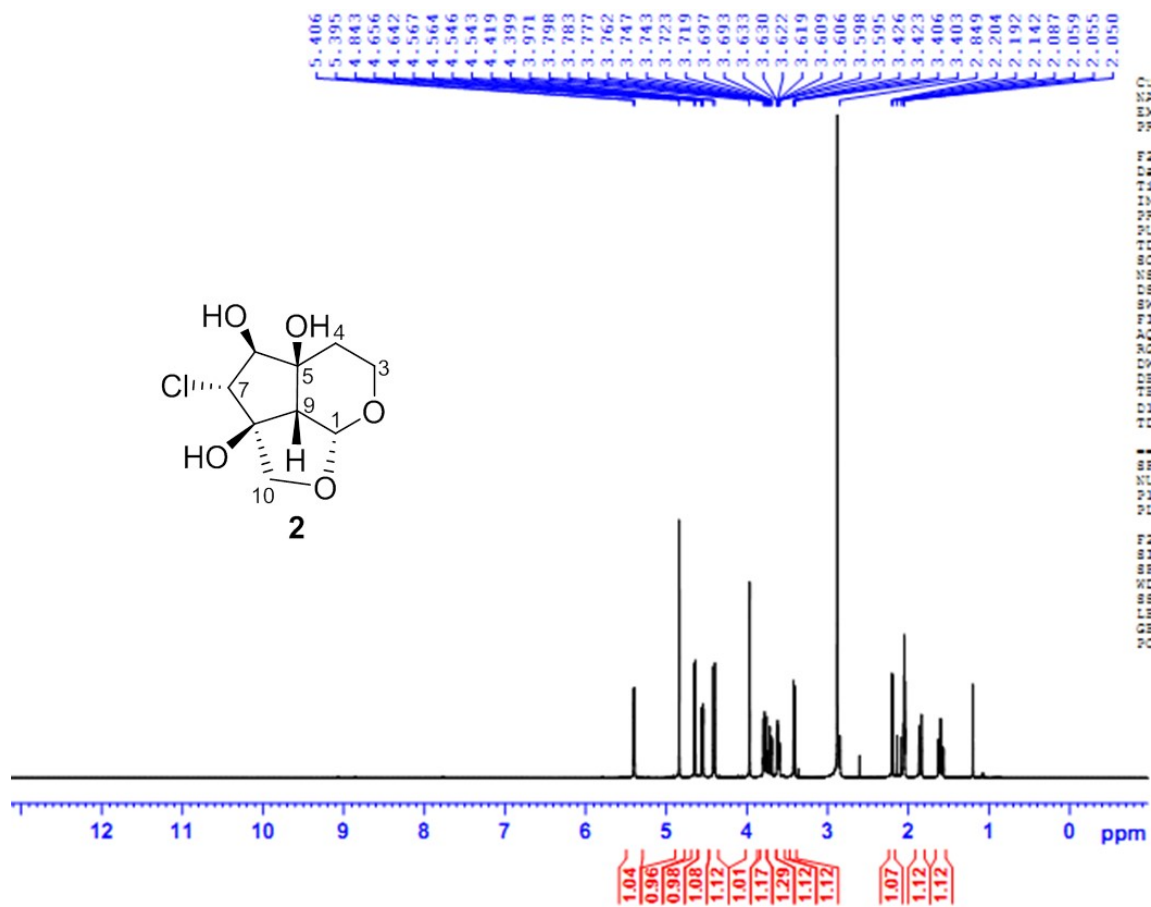


Figure S12: 1H -NMR (500 MHz, CD_3COCD_3) Spectrum of Myopochlorin (2)

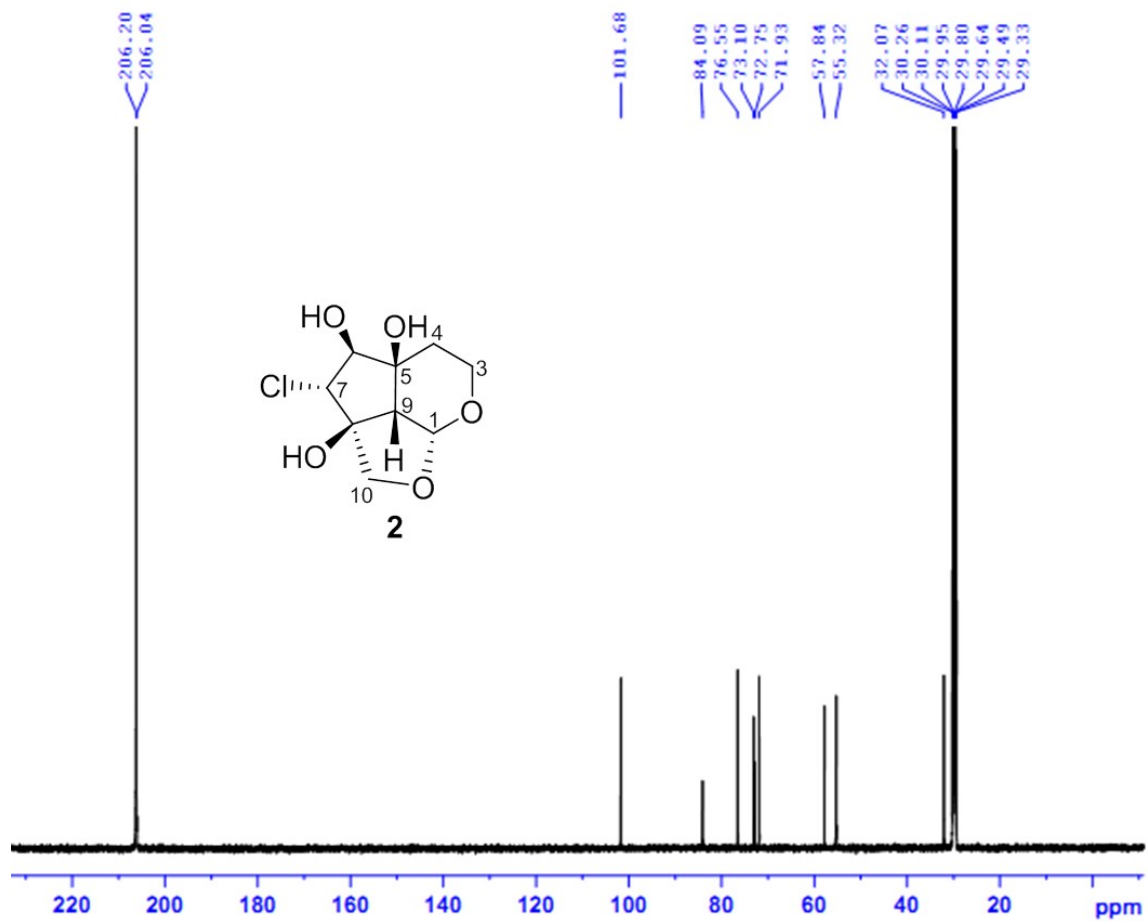


Figure S13: ¹³C-NMR (125 MHz, CD₃COCD₃) Spectrum of Myopochlorin (2)

3-hydroxymyopochlorin (3): ESI-MS (positive): $m/z = 253 [M+H]^+$ ($C_9H_{14}O_6^{35}Cl$), $255 [M+H]^+$ ($C_9H_{14}O_6^{37}Cl$); 1H NMR (500 MHz, CD_3OD) δ : 5.6 (1H, d, $J = 6.0$ Hz, H-1), 5.14 (1H, dd, $J = 3.5, 9.0$ Hz, H-3), 4.50 (1H, d, $J = 10.5$ Hz, H-7), 4.35 (1H, d, $J = 10.5$ Hz, H-10a), 3.63 (1H, d, $J = 10.5$ Hz, H-6), 3.54 (1H, d, $J = 10.5$ Hz, H-10b), 2.24 (1H, d, $J = 6.0$ Hz, H-9), 2.21 (1H, dd, $J = 3.5, 9.0$ Hz, H-4a), 1.46 (1H, dd, $J = 9.0, 13.0$ Hz, H-4b); ^{13}C NMR (125MHz, CD_3OD) data (table S2).

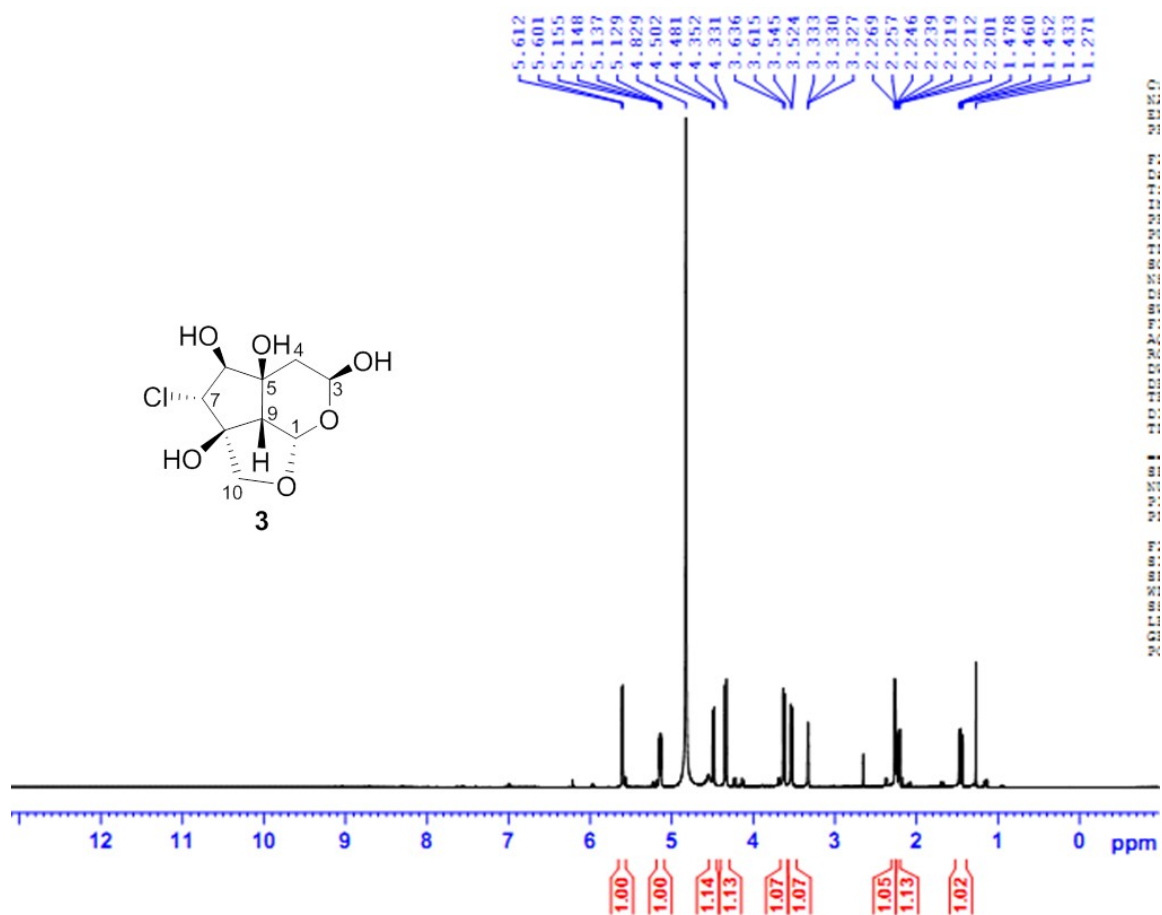


Figure S14: 1H -NMR (500 MHz, CD_3OD) Spectrum of 3-hydroxymyopochlorin (3)

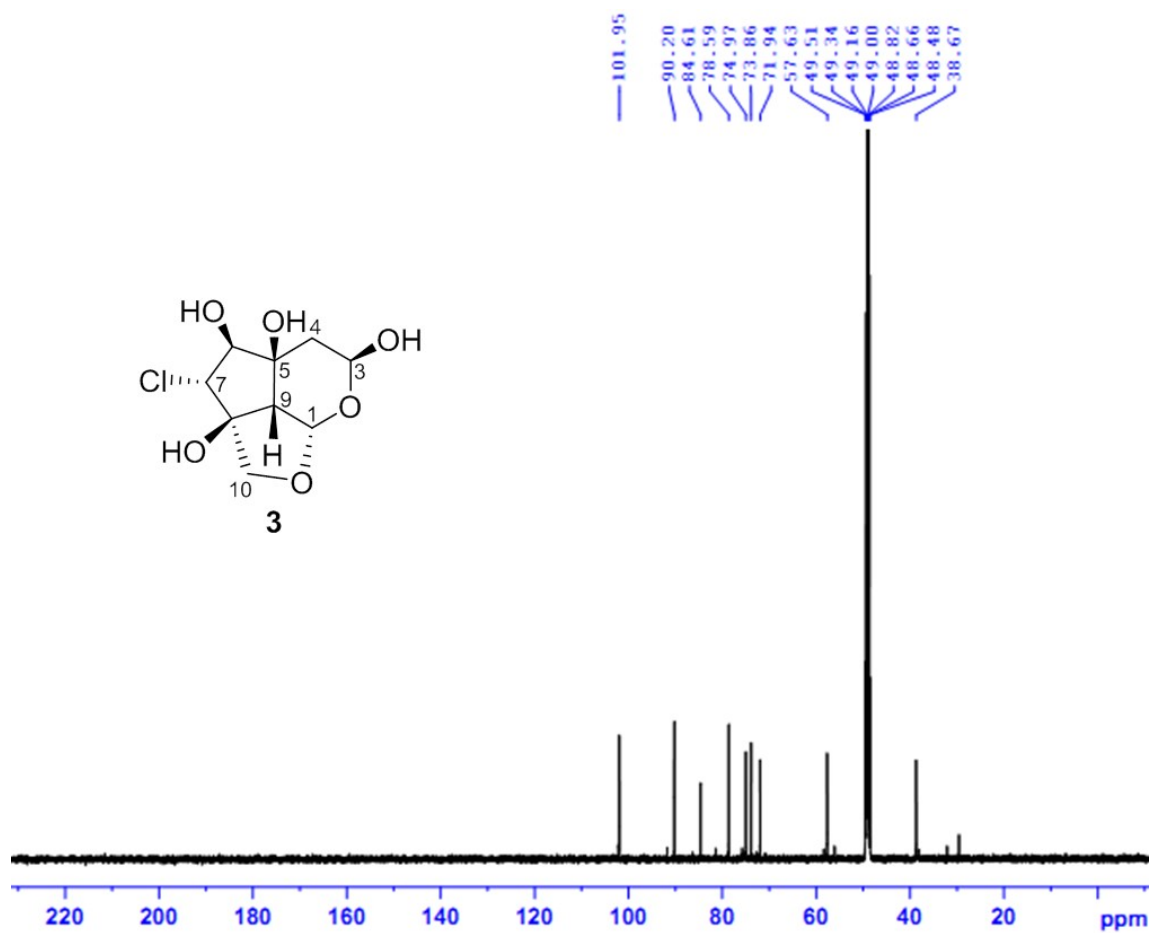


Figure S15: ^{13}C -NMR (125 MHz, CD_3OD) Spectrum of 3-hydroxymyopochlorin (3)

8-*epi*-loganic acid (4): ^1H NMR (500 MHz, CD_3OD) δ : 7.31 (1H, s, H-3), 5.49 (1H, d, $J = 4.0$ Hz, H-1), 4.67 (1H, d, $J = 7.5$ Hz, H-1'), 3.93 (1H, dd, $J = 2.0, 12.0$ Hz, H-6'a), 3.83 (1H, d, $J = 5.5$ Hz, H-7), 3.67 (1H, dd, $J = 6.0, 12.0$ Hz, H-6'b), 3.30-3.36 (3H, m, H-3', 4', 5'), 3.22 (1H, m, H-2'), 3.08 (1H, d, $J = 6.0$ Hz, H-5), 2.60 (1H, m, H-9), 2.13 (1H, m, H-8), 2.06 (1H, m, H-6a), 1.90 (1H, m, H-6b), 1.07 (3H, d, $J = 7.5$ Hz, H₃-10); ^{13}C NMR (125MHz, CD_3OD) data (Table S2).

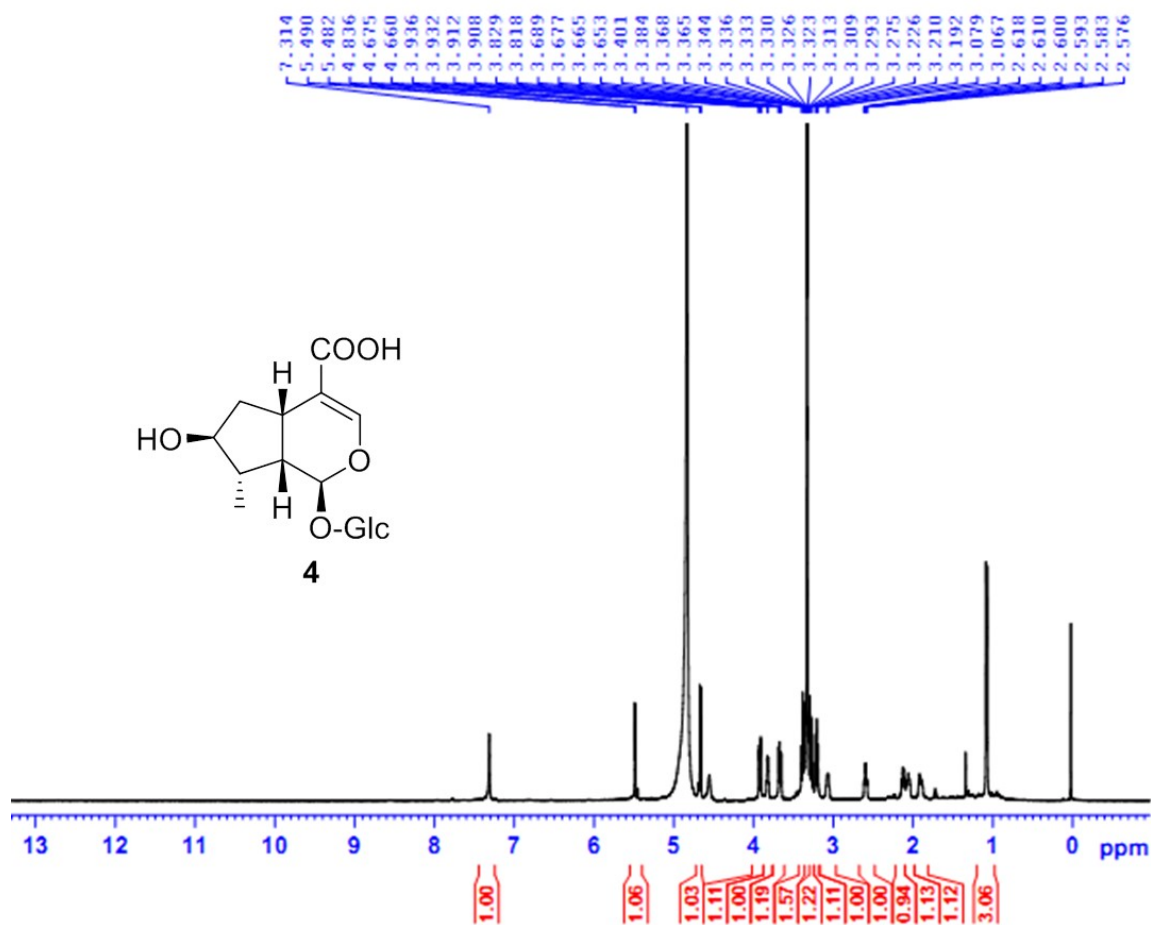


Figure S16: ^1H -NMR (500 MHz, CD_3OD) Spectrum of 8-*epi*-loganic acid (4)

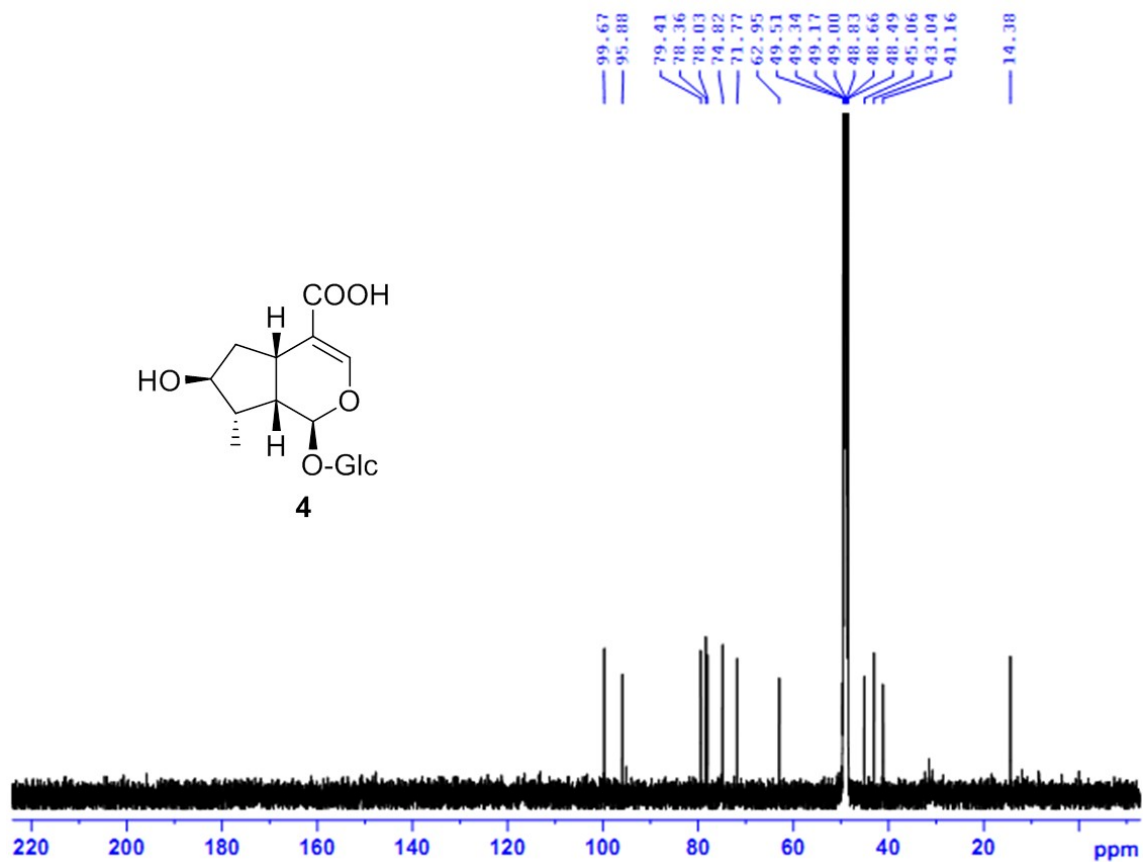


Figure S17: ¹³C-NMR (125 MHz, CD₃OD) Spectrum of 8-*epi*-loganic acid (4)

Ajugol (5): ^1H NMR (500 MHz, CD_3OD) δ : 6.18 (1H, dd, $J = 2.0, 6.0$ Hz, H-3), 5.48 (1H, d, $J = 1.5$ Hz, H-1), 4.88 (1H, dd, $J = 3.0, 6.0$ Hz, H-4), 4.67 (1H, d, $J = 8.0$ Hz, H-1'), 3.94 (1H, m, H-6), 3.89 (1H, m, H-6'a), 3.68 (1H, dd, $J = 6.0, 12.0$ Hz, H-6'b), 3.41 (1H, m, H-3'), 3.32 (2H, m, H-4', 5'), 3.22 (1H, dd, $J = 8.0, 9.0$ Hz, H-2'), 2.75 (1H, m, H-5), 2.57 (1H, dd, $J = 1.5, 9.5$ Hz, H-9), 2.06 (1H, dd, $J = 5.5, 13.5$ Hz, H-7a), 1.82 (1H, dd, $J = 4.5, 13.5$ Hz, H-7b), 1.33 (3H, s, H_3 -10); ^{13}C NMR (125MHz, CD_3OD) data (Table S2).

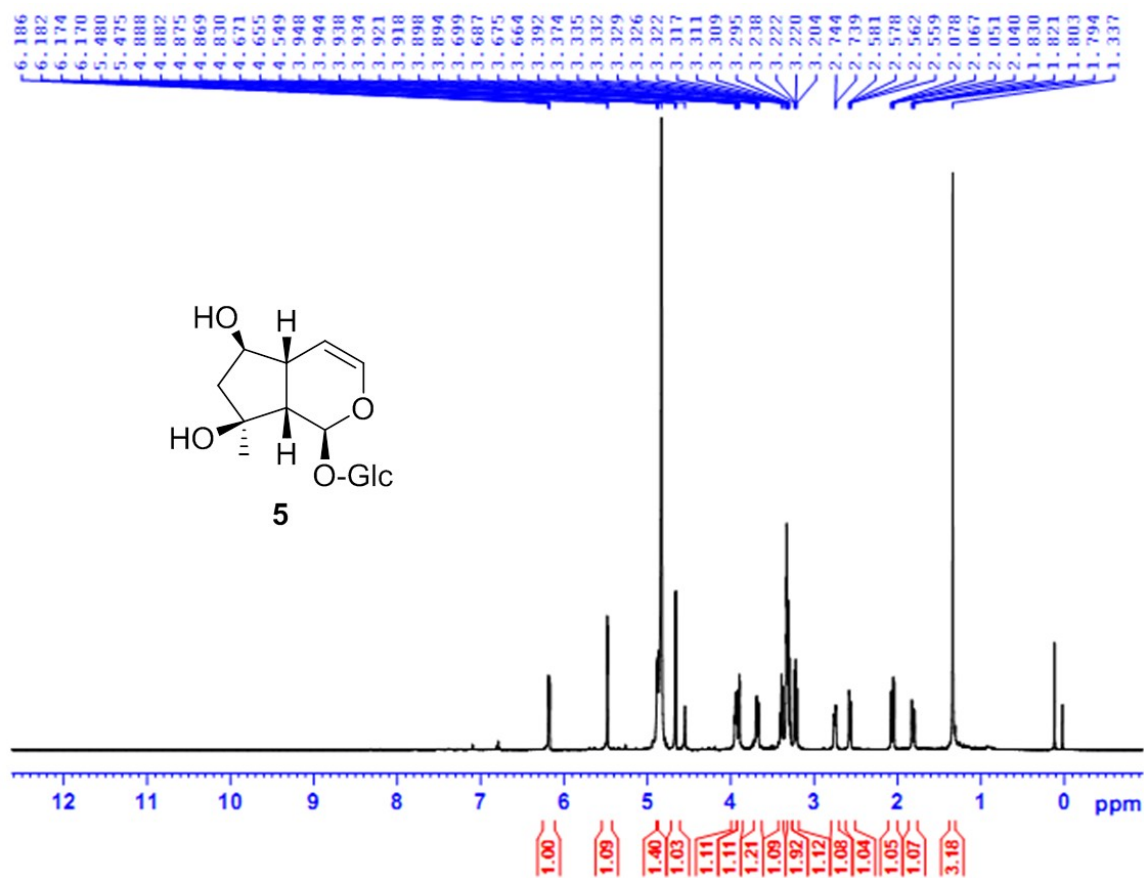
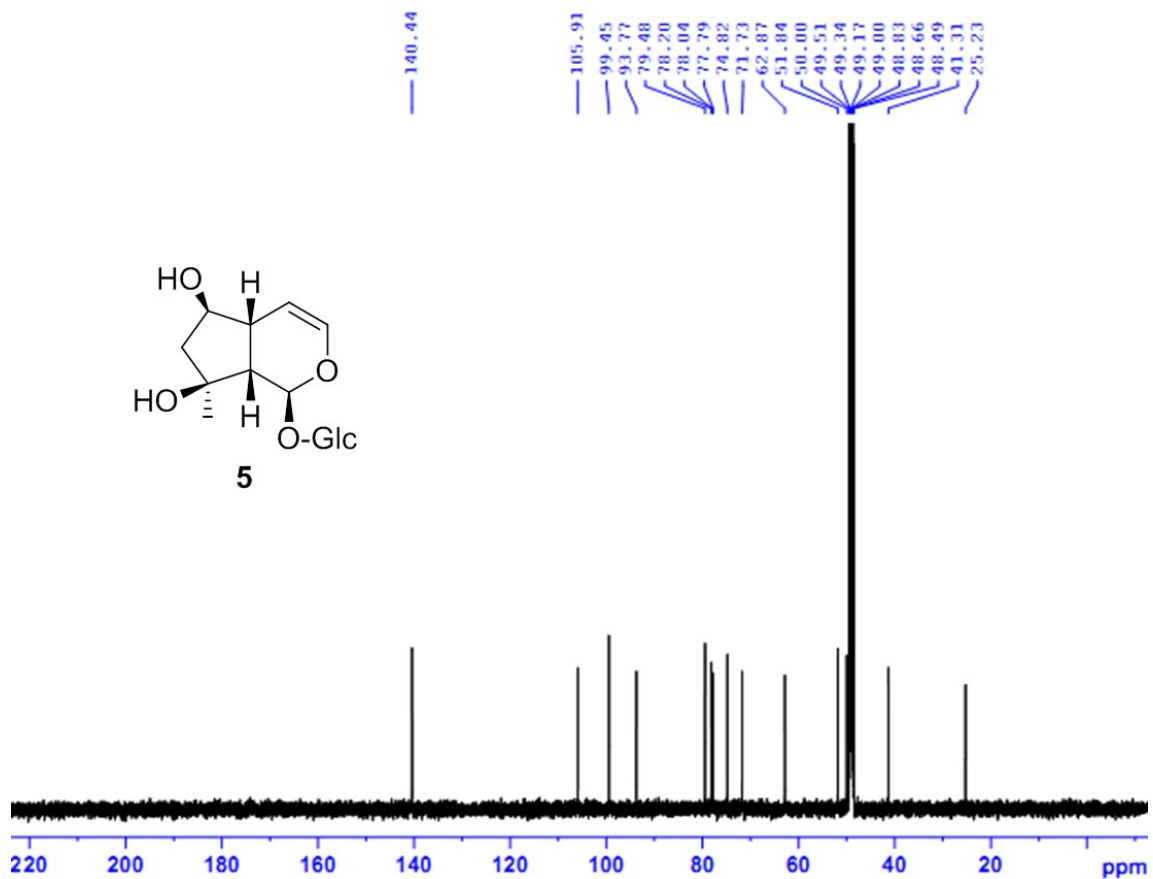


Figure S18: ^1H -NMR (500 MHz, CD_3OD) Spectrum of Ajugol (5)



8-*O*-acetylharpagide (6): ESI-MS (positive): $m/z = 429 [M+Na]^+$ ($C_{17}H_{26}O_{11}Na$); 1H NMR (500 MHz, $DMSO-d_6$) δ : 6.36 (1H, d, $J = 6.0$ Hz, H-3), 5.87 (1H, d, $J = 1.5$ Hz, H-1), 4.88 (1H, dd, $J = 1.5, 6.0$ Hz, H-4), 4.39 (1H, d, $J = 8.0$ Hz, H-1'), 3.70 (1H, dd, $J = 6.0, 12.0$ Hz, H-6'a), 3.57 (1H, t, $J = 4.5$ Hz, H-6 α), 3.48 (1H, d, $J = 12.0$ Hz, H-6'b), 2.65 (1H, brs, H-9), 2.08 (1H, d, $J = 15.0$ Hz, H-7 β), 1.93 (3H, s, 8-OAc), 1.80 (1H, dd, $J = 4.5, 15.0$ Hz, H-7 α), 1.36 (3H, s, H₃-10); ^{13}C NMR (125MHz, $DMSO-d_6$) data (Table S2).

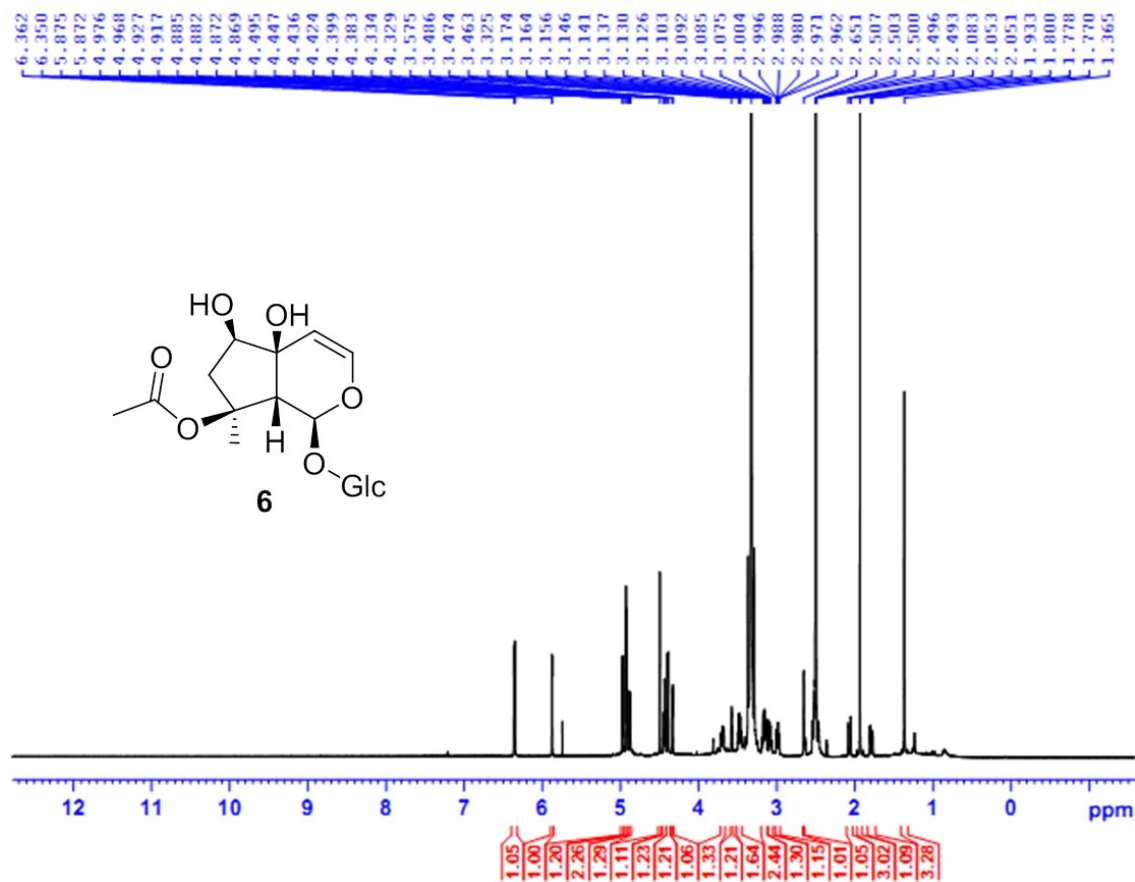


Figure S20: 1H -NMR (500 MHz, $DMSO-d_6$) Spectrum of 8-*O*-acetylharpagide (6)

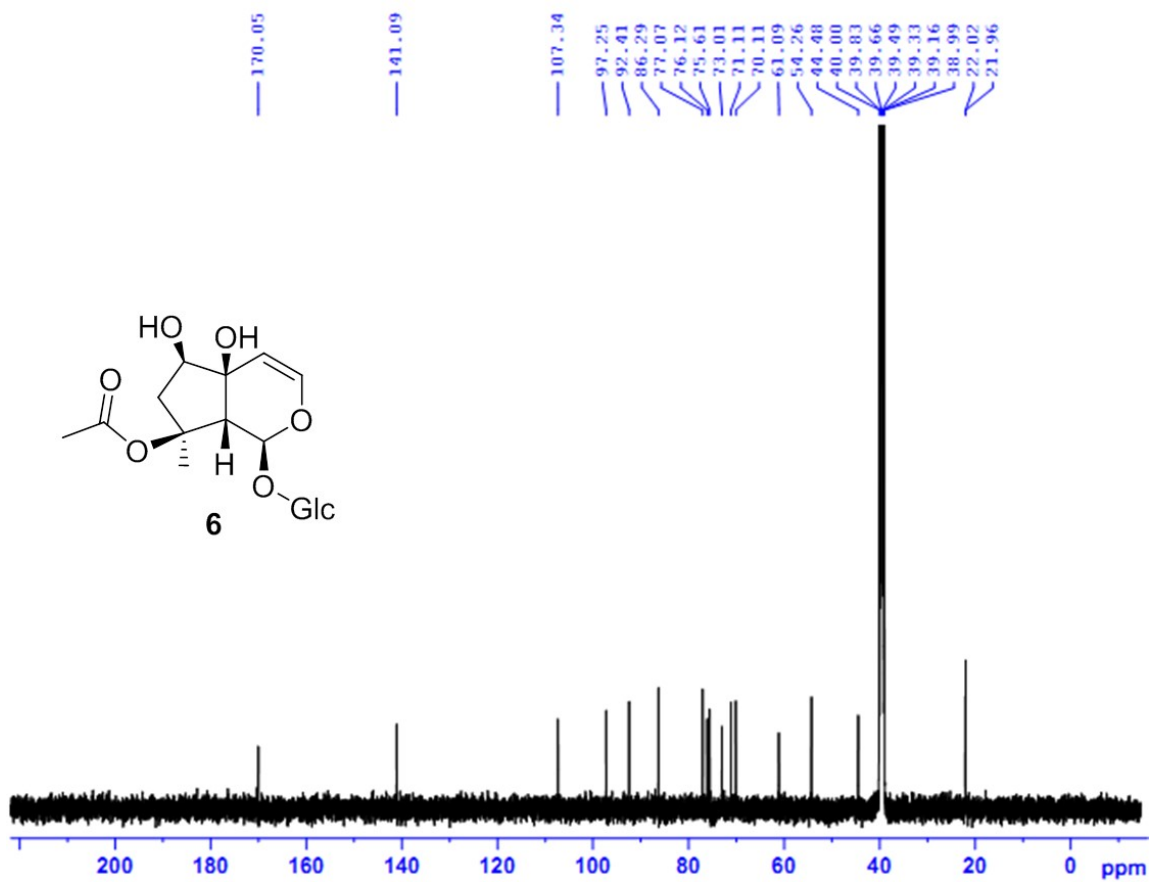


Figure S21: ^{13}C -NMR (125 MHz, $\text{DMSO-}d_6$) Spectrum of 8-O-acetylharpagide (6)

Harpagide (7): ESI-MS (negative): $m/z = 363$ $[M-H]^-$ ($C_{15}H_{23}O_{10}$); 1H NMR (500 MHz, DMSO- d_6) δ : 6.26 (1H, d, $J = 6.5$ Hz, H-3), 5.55 (1H, d, $J = 1.5$ Hz, H-1), 4.89 (1H, dd, $J = 1.5, 6.5$ Hz, H-4), 4.39 (1H, d, $J = 7.5$ Hz, H-1'), 3.69 (1H, dd, $J = 5.0, 10.0$ Hz, H-6'a), 3.54 (1H, d, $J = 5.0$ Hz, H-6), 3.47 (1H, d, $J = 10.0$ Hz, H-6'b), 3.16-2.98 (4H, m, H-2', 3', 4', 5'), 2.35 (1H, brs, H-9), 1.72 (1H, dd, $J = 5.0, 13.0$ Hz, H-7a), 1.63 (1H, dd, $J = 5.0, 13.0$ Hz, H-7b), 1.08 (3H, s, H₃-10); ^{13}C NMR (125 MHz, DMSO- d_6) data (Table S2)

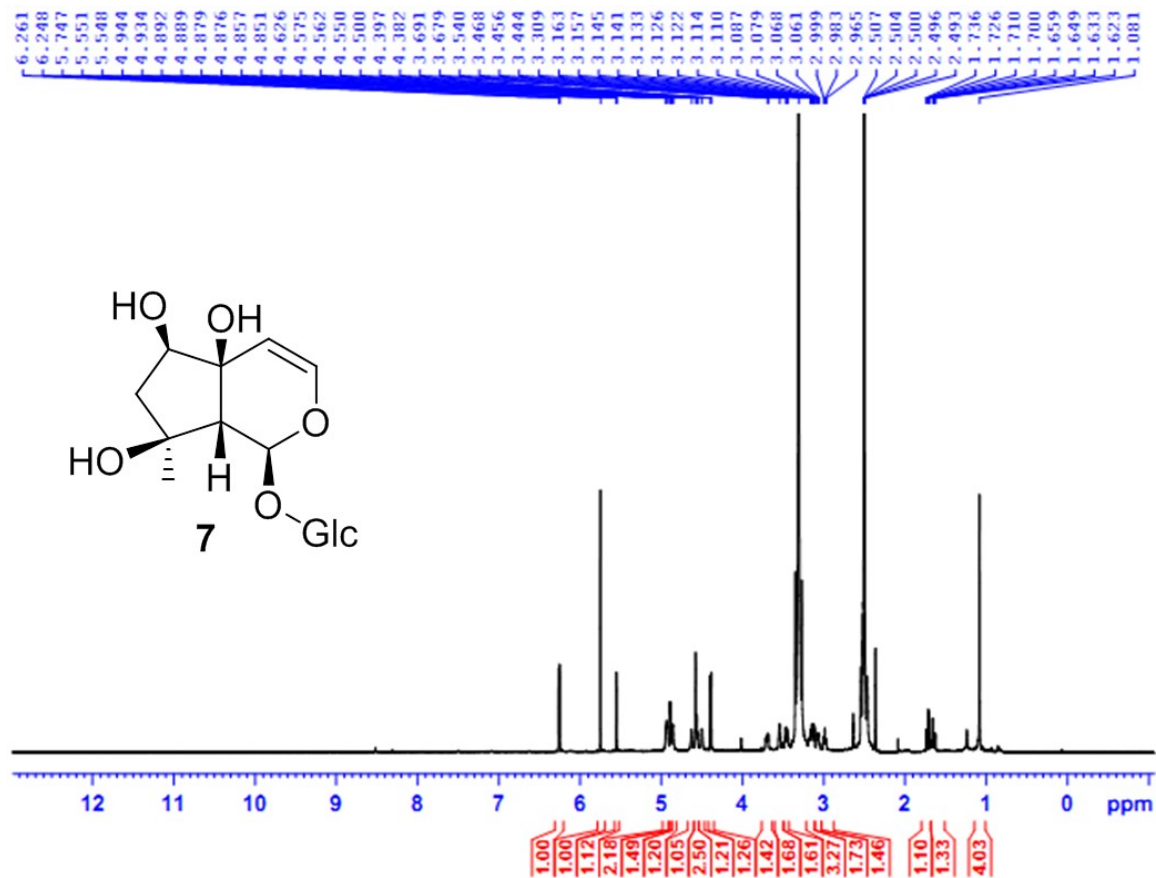


Figure S22: 1H -NMR (500 MHz, DMSO- d_6) Spectrum of Harpagide (7)

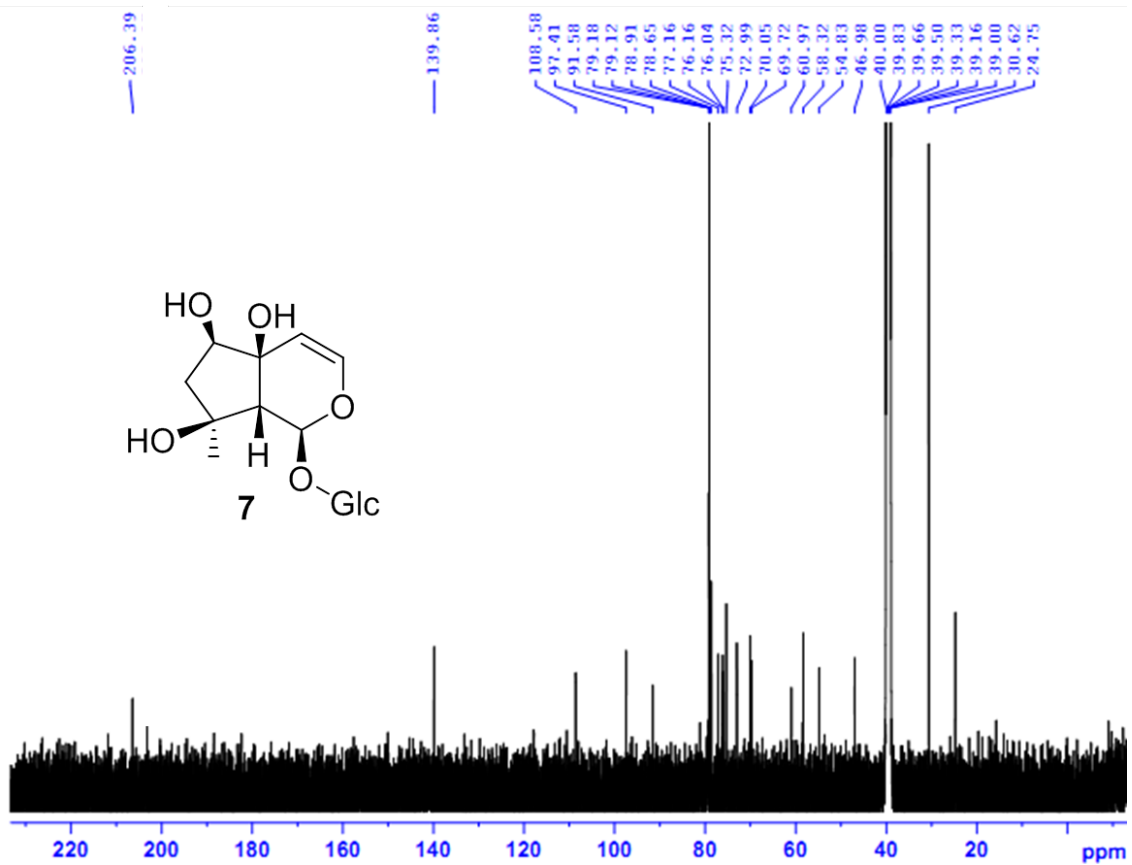


Figure S23: ¹³C-NMR (125 MHz, DMSO-*d*₆) Spectrum of Harpagide (7)

Cis-melilotoside (**8**): ^1H NMR (500 MHz, CD_3OD) and ^{13}C NMR (125 MHz, CD_3OD) data (Table S3)

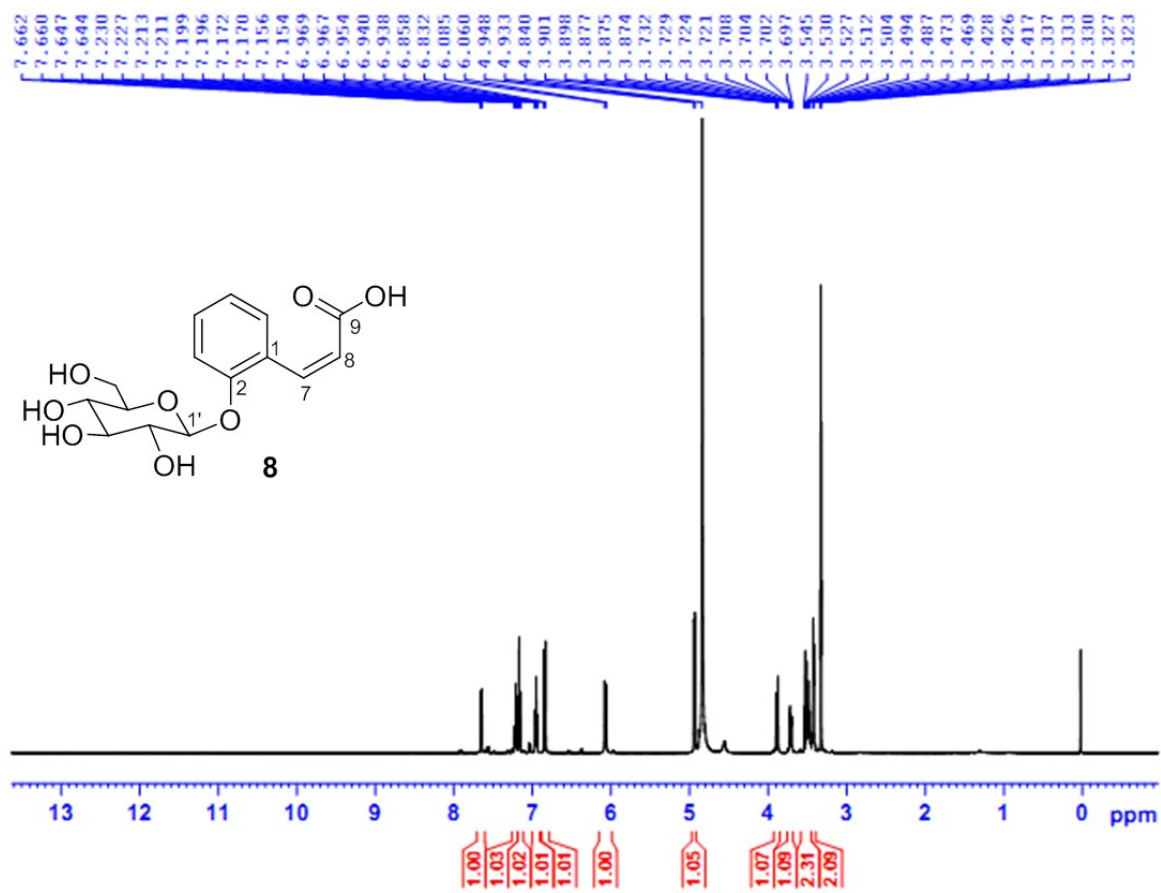


Figure S24: ^1H -NMR (500 MHz, CD_3OD) Spectrum of *Cis*-melilotoside (**8**)

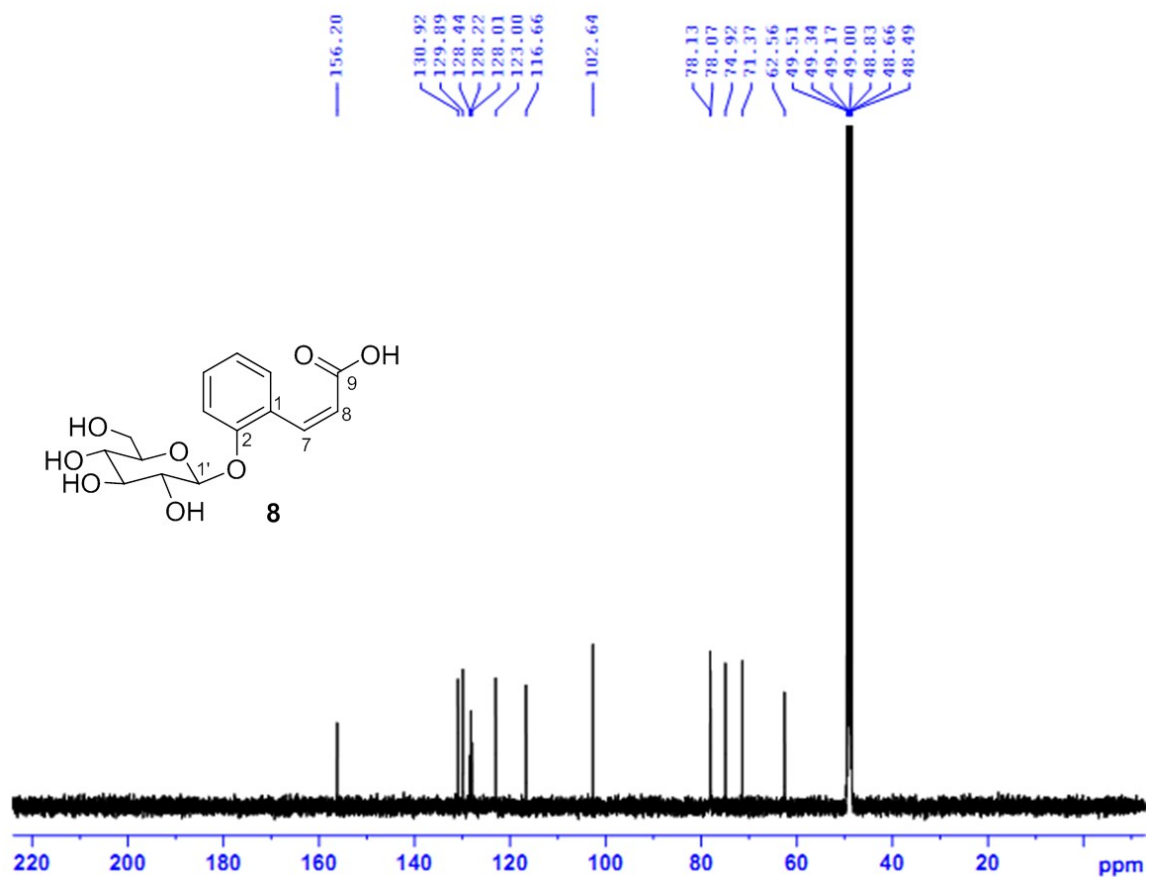


Figure S25: ¹³C-NMR (125 MHz, CD₃OD) Spectrum of *Cis*-melilotoside (8)

Trans-melilotoside (9): ^1H NMR (500 MHz, CD_3OD) and ^{13}C NMR (125 MHz, CD_3OD) data (Table S3)

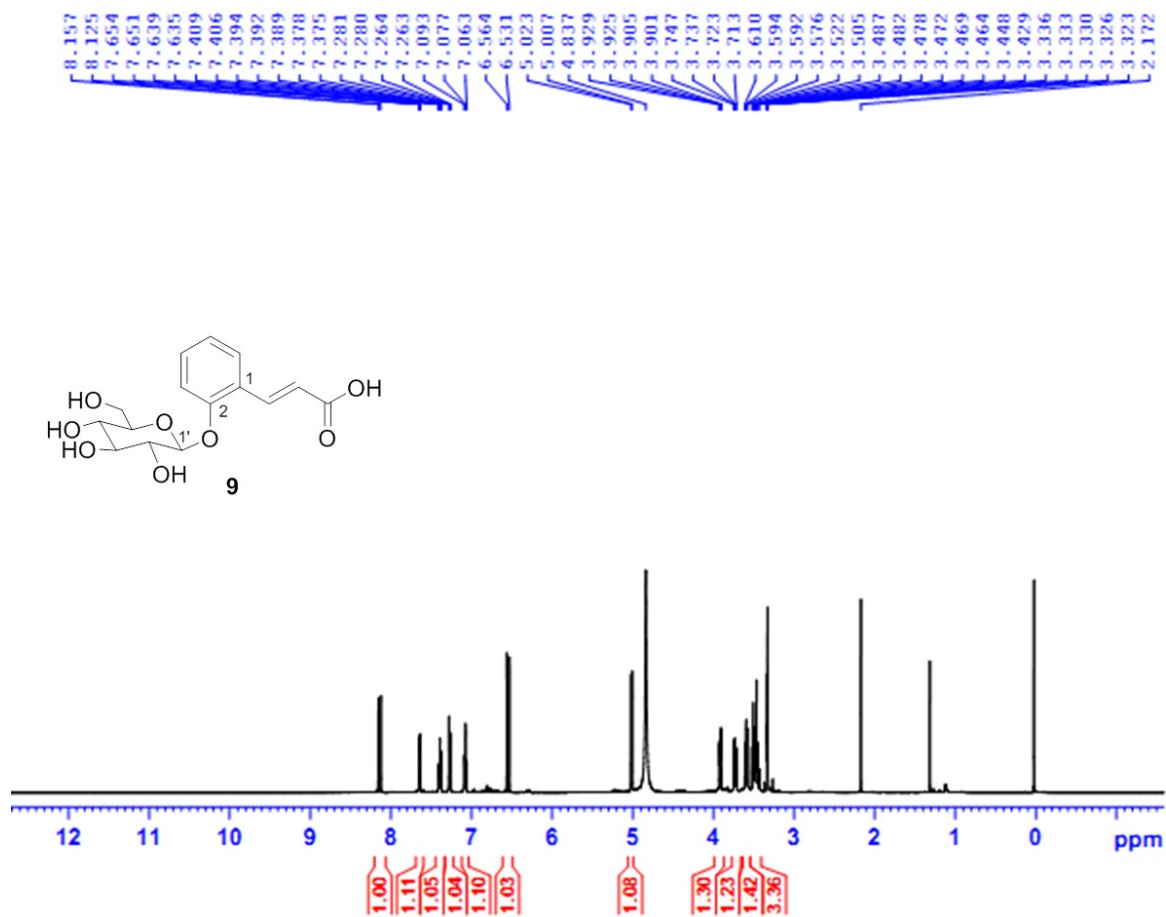


Figure S26: ^1H -NMR (500 MHz, CD_3OD) Spectrum of *Trans*-melilotoside (9)

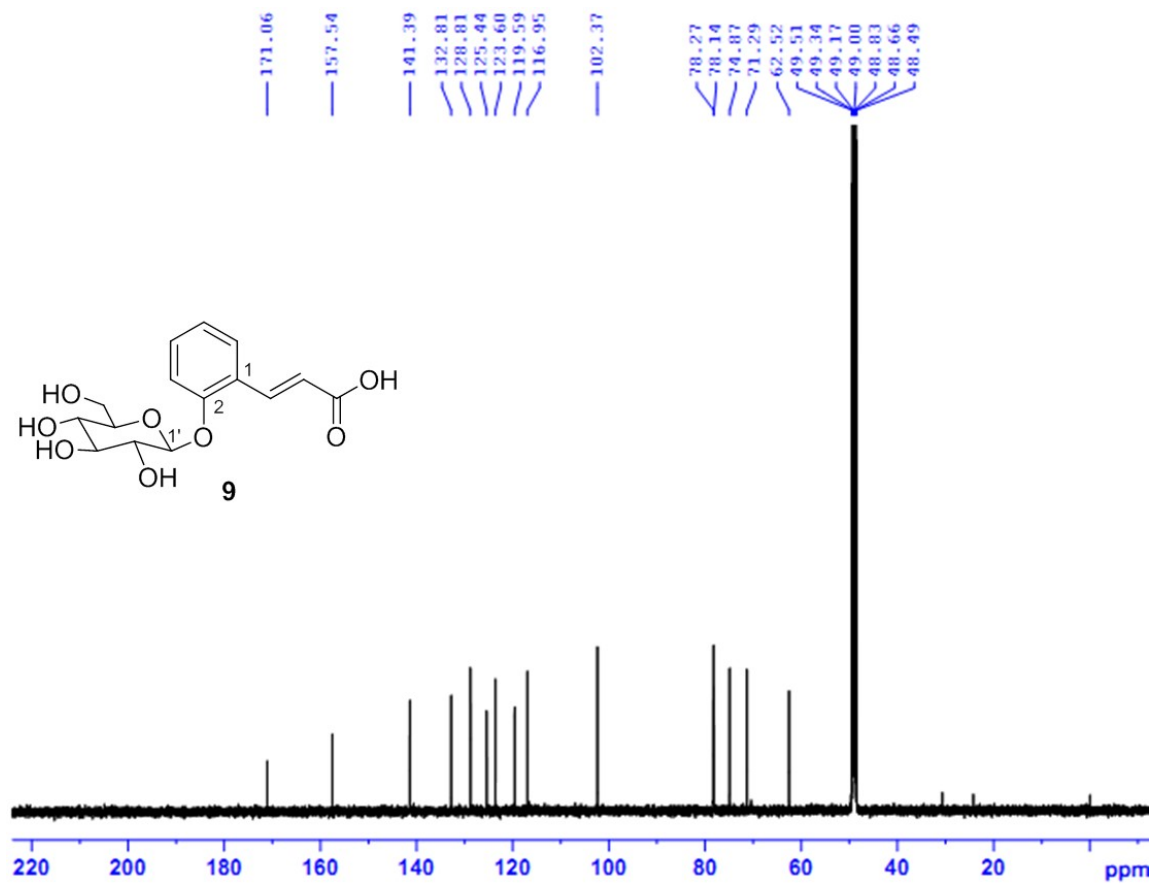


Figure S27: ^{13}C -NMR (125 MHz, CD_3OD) Spectrum of *Trans*-melilotoside (9)

Octane-1-en-3-ol-3-O- β -D-glucopyranosyl(1 \rightarrow 2)- β -D-glucopyranoside (10): ^1H NMR (500 MHz, CD_3OD) and ^{13}C NMR (125 MHz, CD_3OD) data (Table S4)

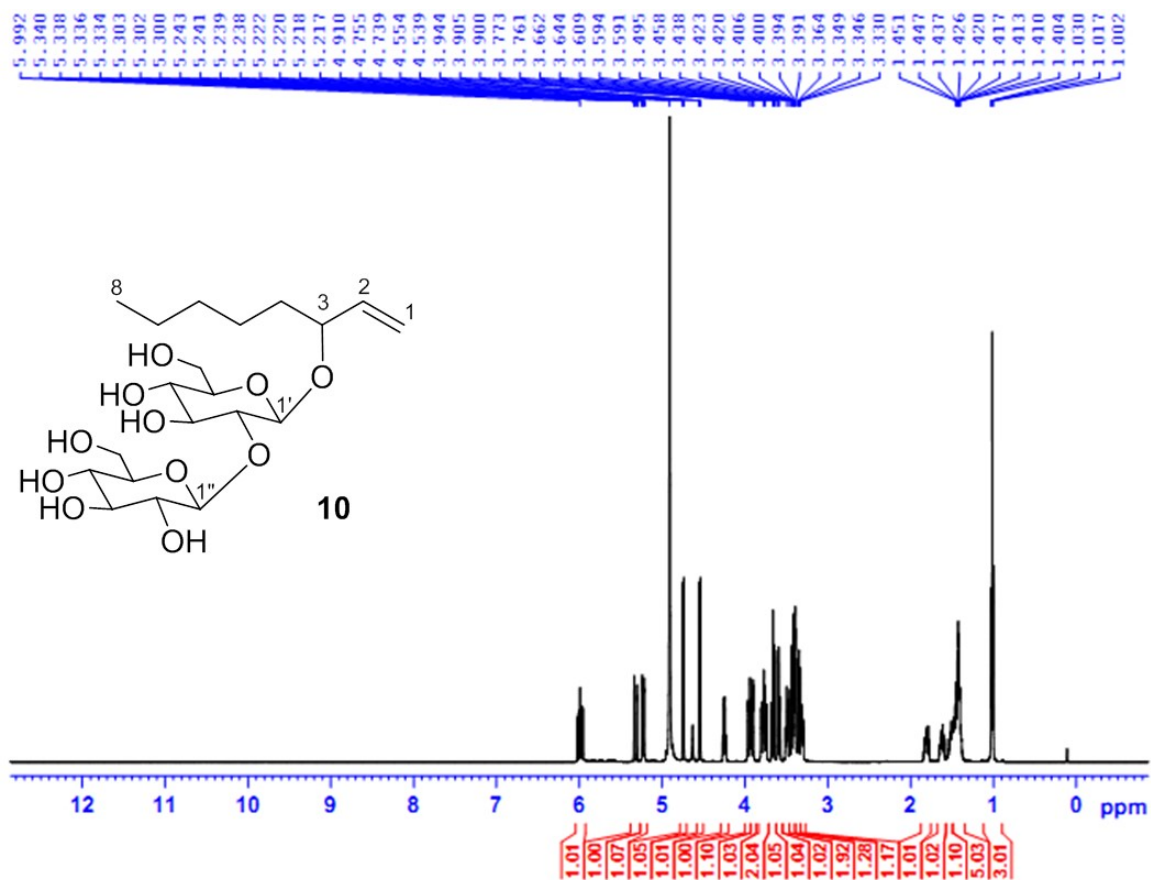


Figure S28: ^1H -NMR (500 MHz, CD_3OD) Spectrum of Compound 10

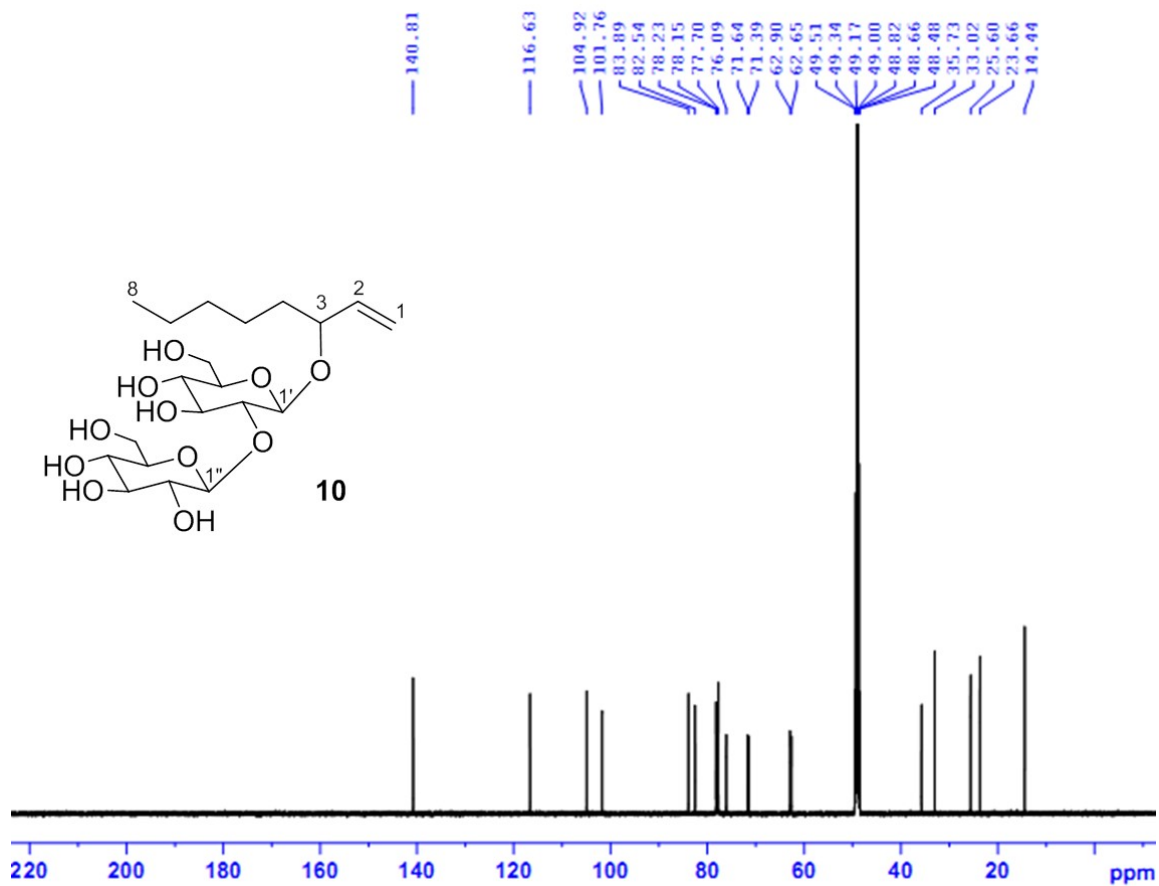


Figure S29: ¹³C-NMR (125 MHz, CD₃OD) Spectrum of Compound **10**

Ebracteatoside B (11): ^1H NMR (500 MHz, CD_3OD) and ^{13}C NMR (125 MHz, CD_3OD) data (Table S4)

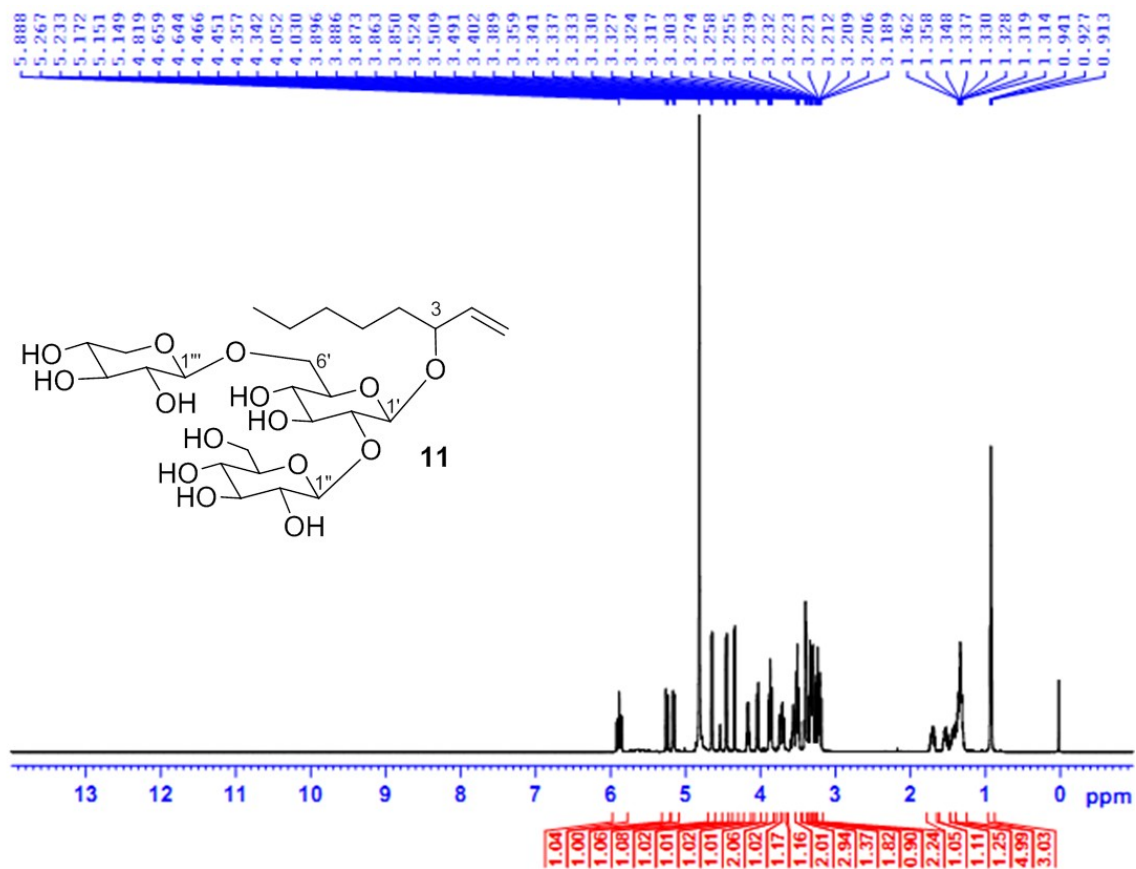


Figure S30: ^1H -NMR (500 MHz, CD_3OD) Spectrum of Ebracteatoside B (11)

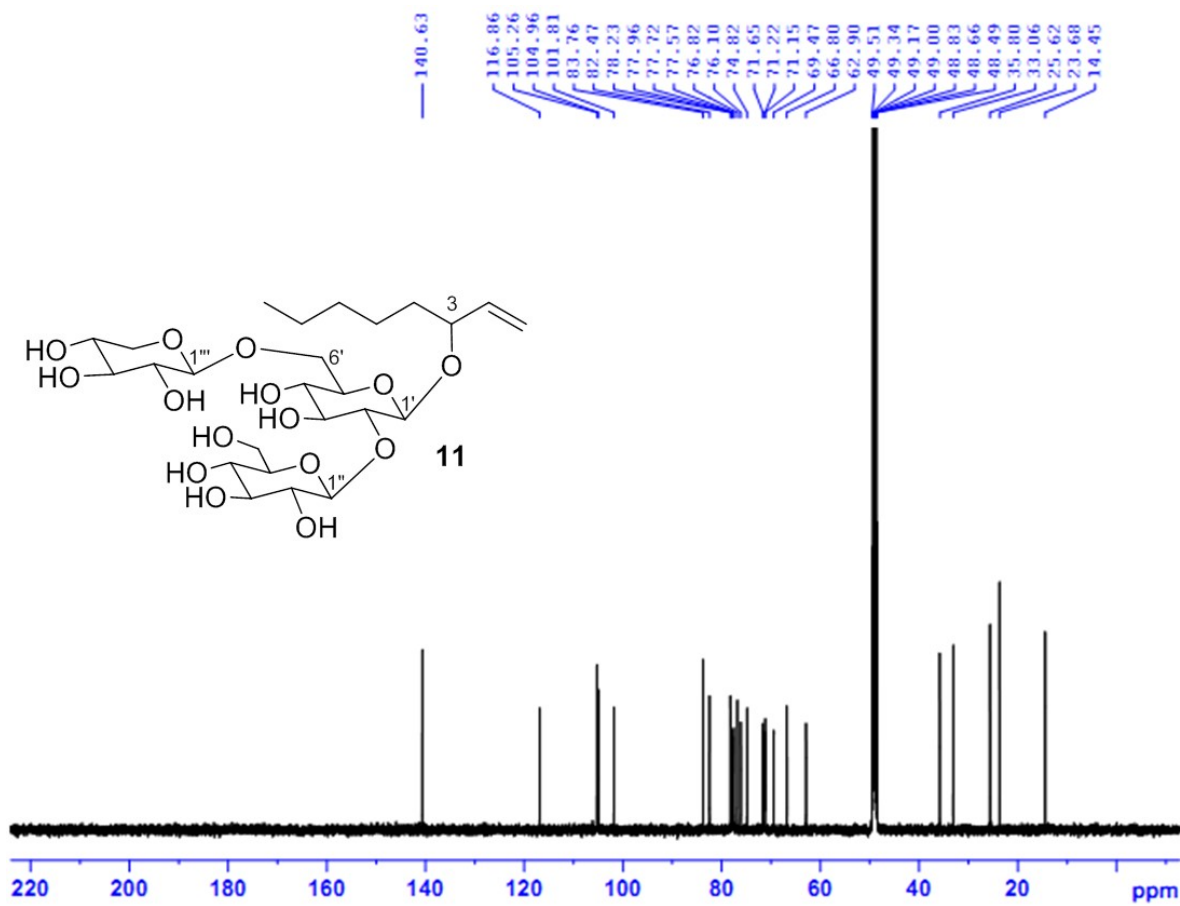


Figure S31: ¹³C-NMR (125 MHz, CD₃OD) Spectrum of Ebracteatoside B (11)

Lariciresinol-9-*O*- β -D-glucopyranoside (12): ^1H NMR (500 MHz, CD_3OD) δ : 6.95 (1H, d, $J = 2.0$ Hz, H-2), 6.82 (1H, d, $J = 2.0$ Hz, H-2'), 6.81 (1H, dd, $J = 2.0, 8.0$ Hz, H-6), 6.78 (1H, d, $J = 8.0$ Hz, H-5), 6.73 (1H, d, $J = 8.0$ Hz, H-5'), 6.68 (1H, dd, $J = 2.0, 8.0$ Hz, H-6'), 4.87 (1H, d, $J = 6.5$ Hz, H-7), 4.32 (1H, d, $J = 7.5$ Hz, H-1''), 4.07 (1H, dd, $J = 6.5, 10.0$ Hz, H-9a), 4.01 (1H, dd, $J = 6.5, 8.5$ Hz, H-9'a), 3.90 (1H, m, H-6''a), 3.87 (3H, s, 3-OCH₃), 3.85 (3H, s, 3'-OCH₃), 3.79 (1H, dd, $J = 7.5, 10.0$ Hz, H-9b), 3.76 (1H, dd, $J = 6.5, 8.5$ Hz, H-9'b), 3.70 (1H, dd, $J = 5.5, 12.0$ Hz, H-6''b), 3.38 (1H, m, H-3''), 3.30 (2H, m, H-4'', 5''), 3.24 (1H, dd, $J = 8.0, 9.0$ Hz, H-2''), 2.94 (1H, dd, $J = 5.0, 13.5$ Hz, H-7'a), 2.79 (1H, m, H-8'), 2.55 (1H, m, H-7'b), 2.51 (1H, m, H-8); ^{13}C NMR (125 MHz, CD_3OD) δ : 149.0 (C-3), 148.9 (C-3'), 147.0 (C-4), 145.8 (C-4'), 135.6 (C-1), 133.7 (C-1'), 122.3 (C-6'), 119.8 (C-6), 116.1 (C-5'), 116.0 (C-5), 113.5 (C-2'), 110.8 (C-2), 104.7 (C-1''), 84.2 (C-7), 78.2 (C-3''), 78.0 (C-5''), 75.2 (C-2''), 73.6 (C-9'), 71.7 (C-4''), 68.5 (C-9), 62.7 (C-6''), 56.4 (3, 3'-OCH₃), 51.7 (C-8), 43.9 (C-8'), 33.9 (C-7').

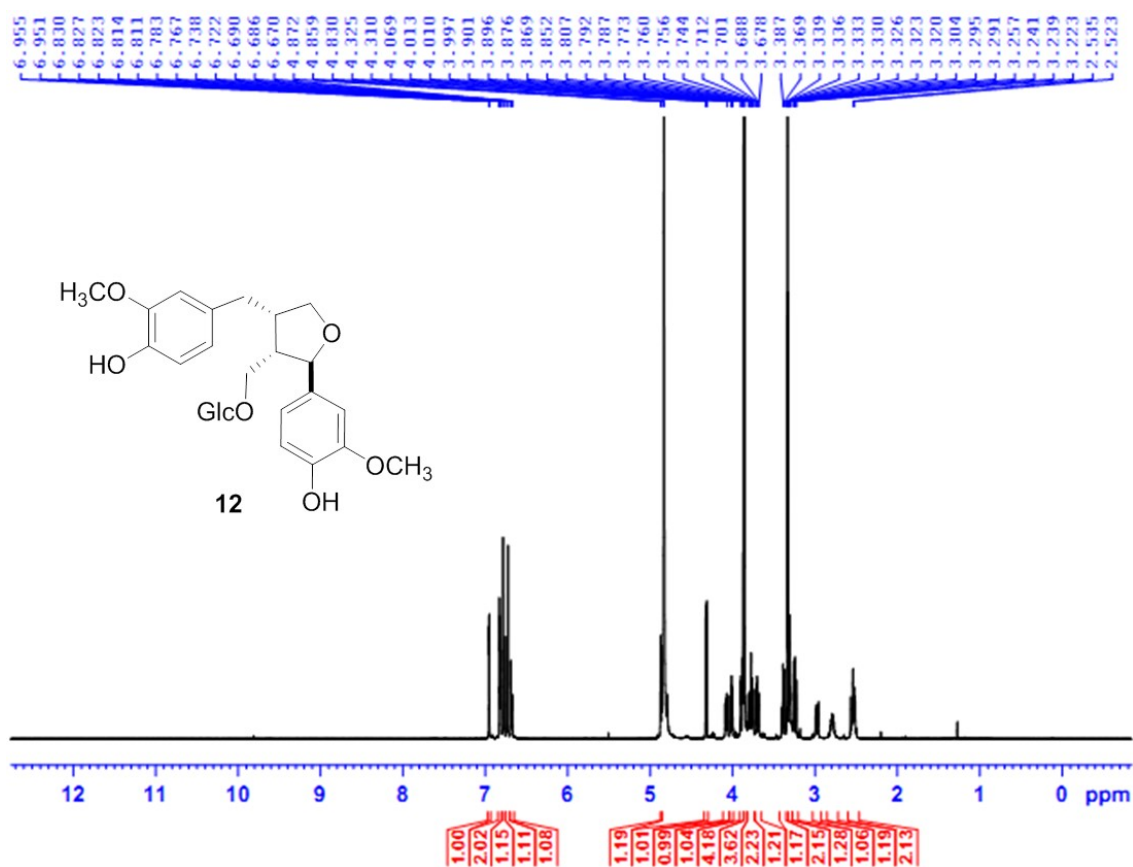


Figure S32: ^1H -NMR (500 MHz, CD_3OD) Spectrum of Lariciresinol-9-*O*- β -D-glucopyranoside (12)

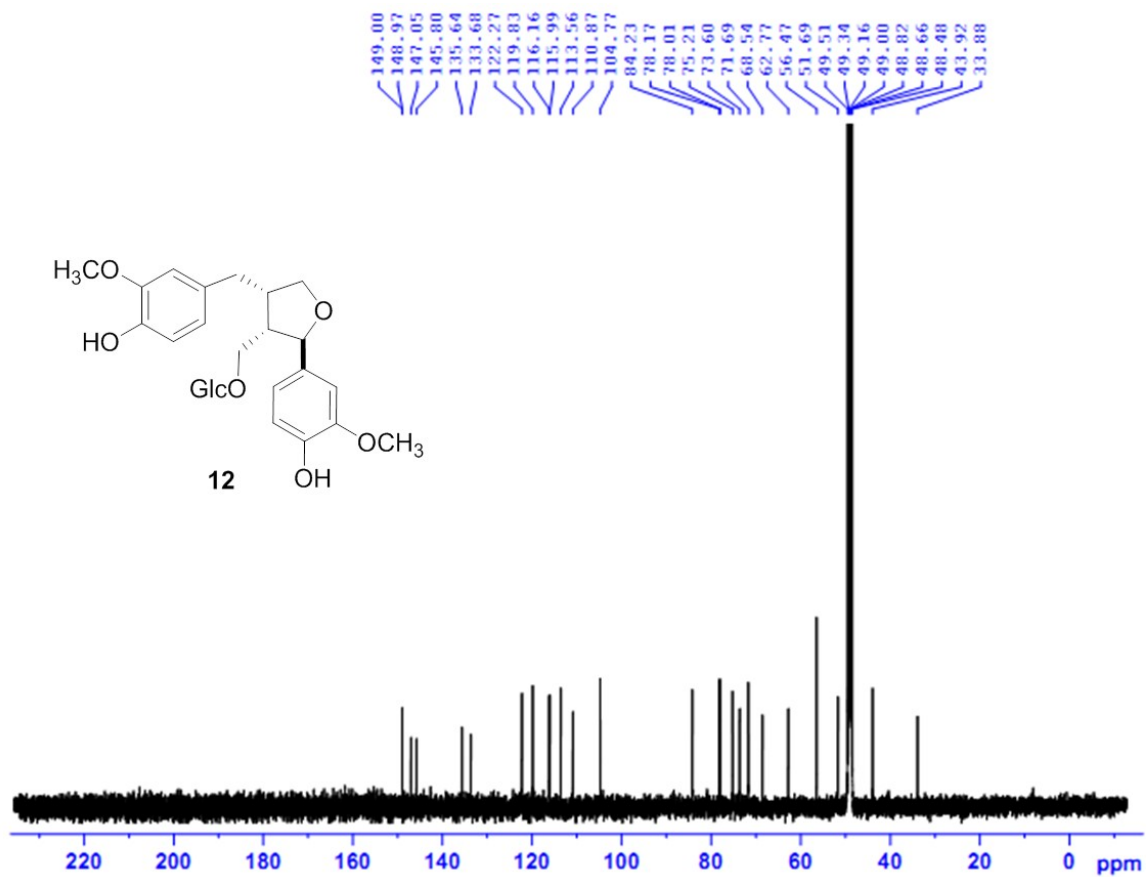


Figure S33: ¹³C-NMR (125 MHz, CD₃OD) Spectrum of Lariciresinol-9-O-β-D-glucopyranoside (**12**)

Ginsenoside Rg1 (13): ^1H NMR (500 MHz, CD_3OD) and ^{13}C NMR (125 MHz, CD_3OD) data (Table S5).

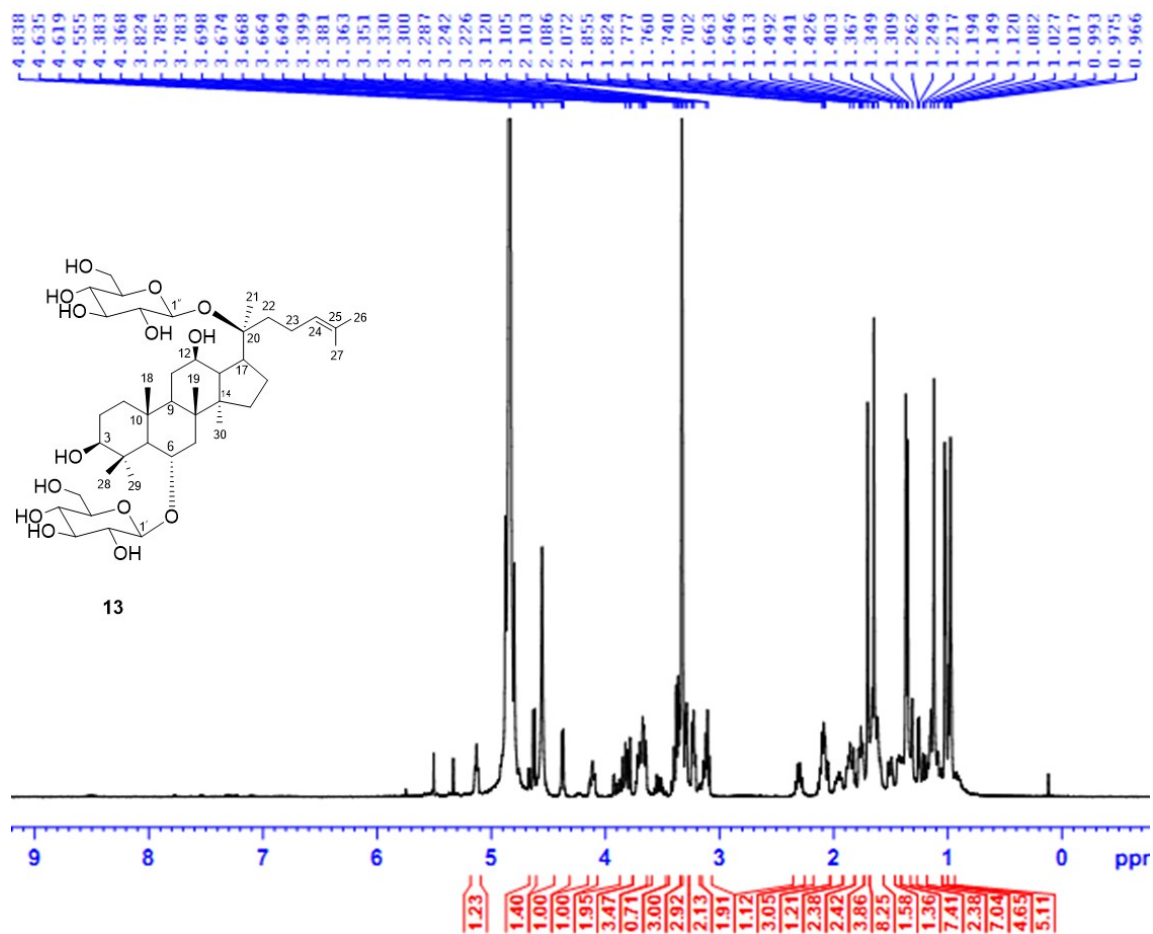


Figure S34: ^1H -NMR (500 MHz, CD_3OD) Spectrum of Ginsenoside Rg1 (13)

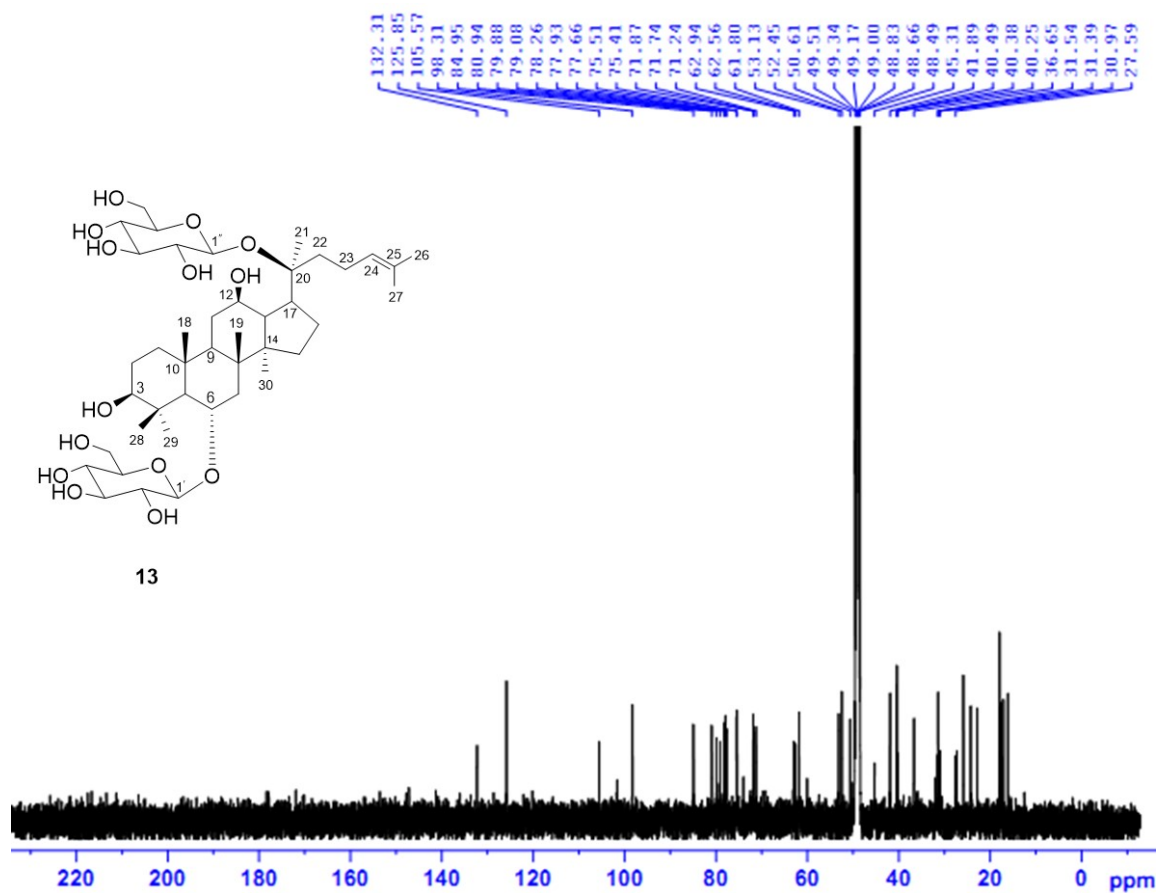


Figure S35: ¹³C-NMR (125 MHz, CD₃OD) Spectrum of Ginsenoside Rg1 (13)

Notoginsenoside-R1 (14): HR ESI-MS: m/z 987.5132 $[M + \text{MeOH} + \text{Na}]^+$ (calcd. for $\text{C}_{48}\text{H}_{84}\text{O}_{19}\text{Na}$, 987.51592); ^1H NMR (500 MHz, CD_3OD) and ^{13}C NMR (125 MHz, CD_3OD) data (Table S5).

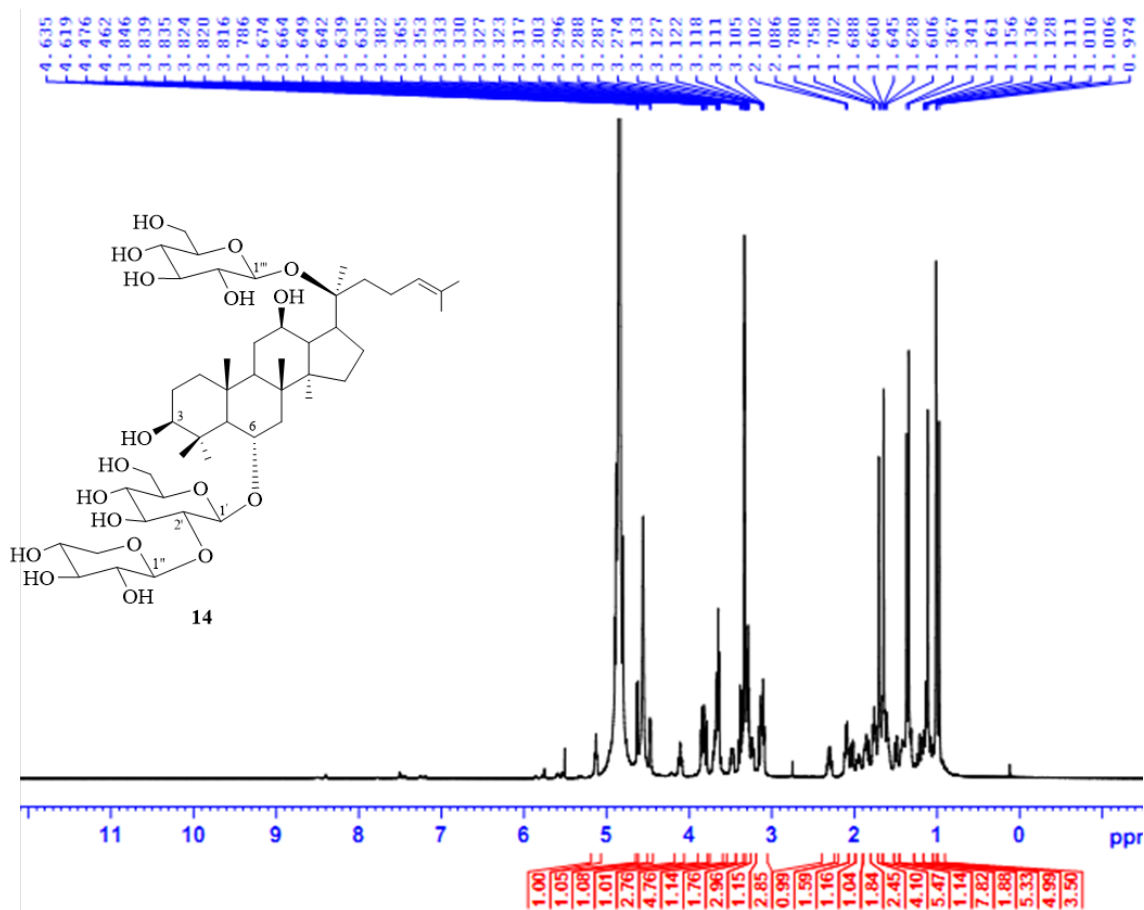


Figure S36: ^1H -NMR (500 MHz, CD_3OD) Spectrum of Notoginsenoside-R1 (14)

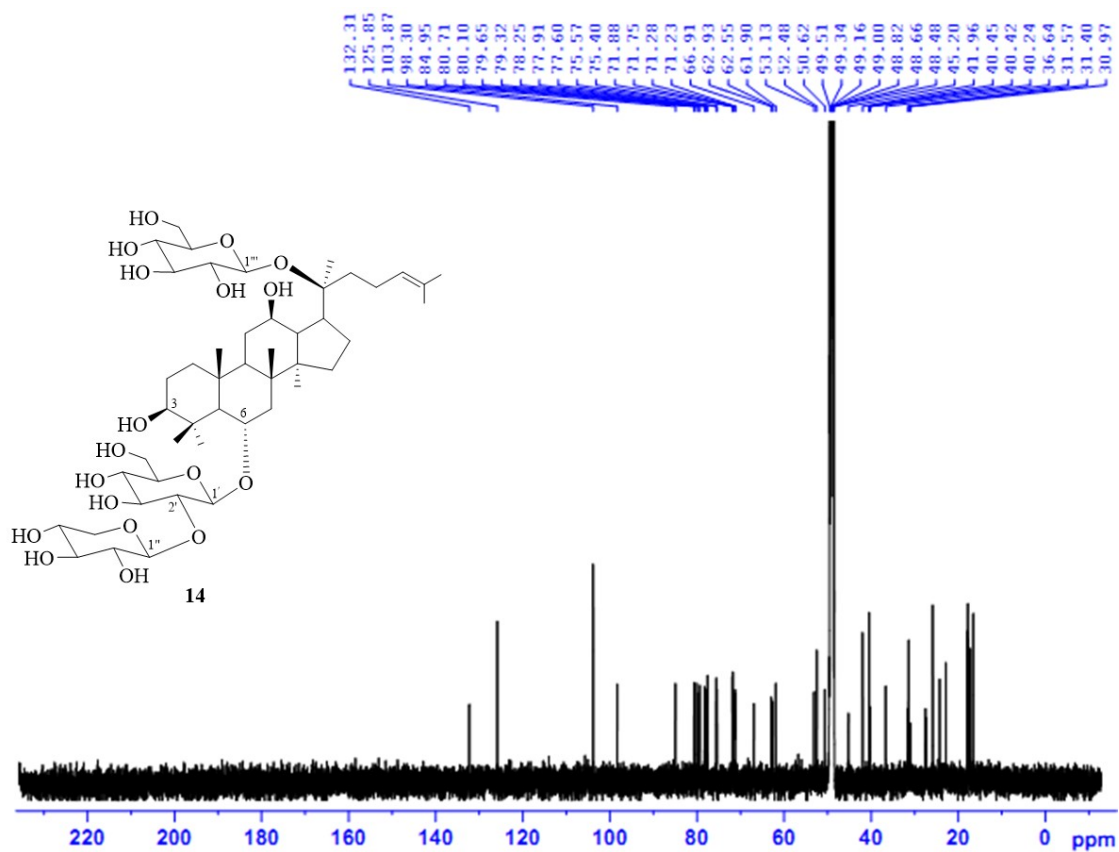


Figure S37: ¹³C-NMR (125 MHz, CD₃OD) Spectrum of Notoginsenoside-R1 (14)

Ginsenoside Rb1 (15): ^1H NMR (500 MHz, CD_3OD) and ^{13}C NMR (125 MHz, CD_3OD) data (Table S5).

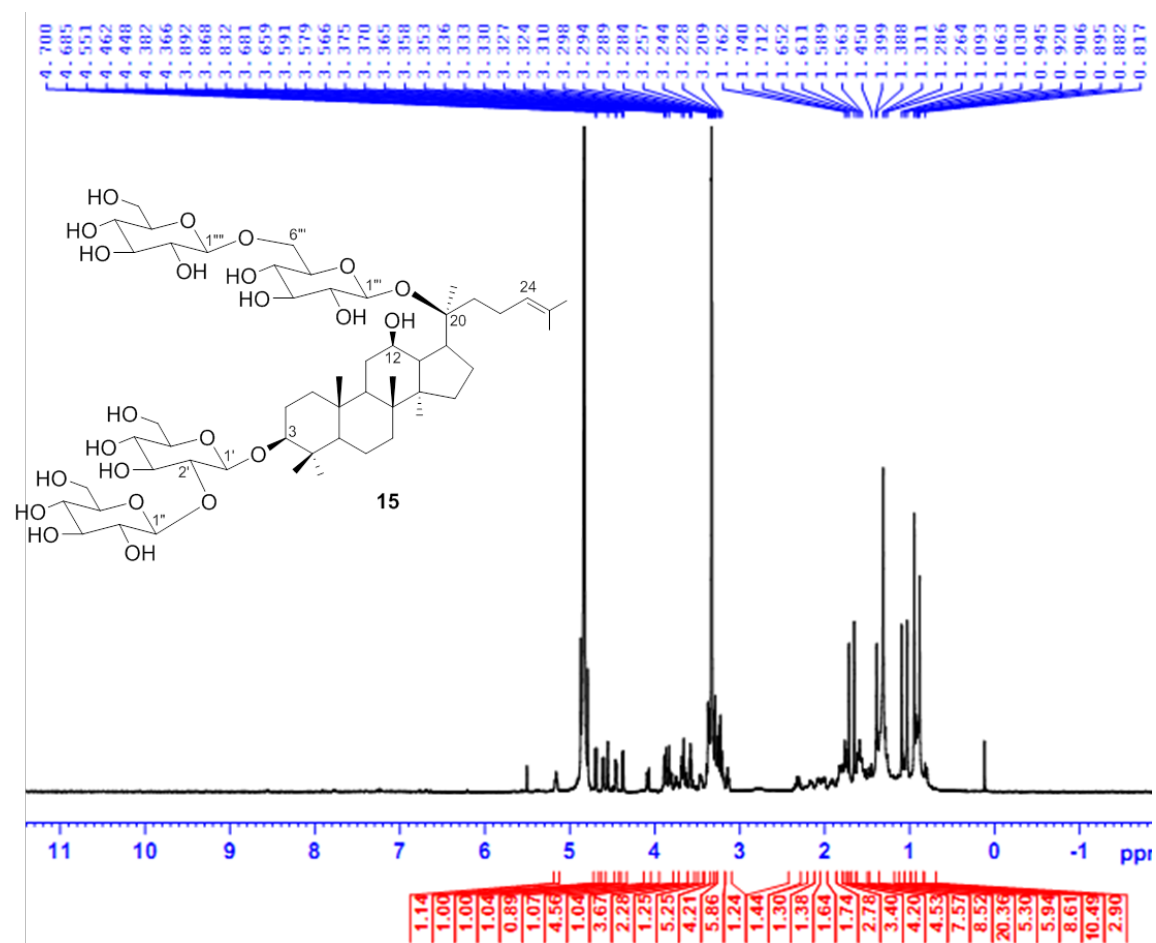


Figure S38: ^1H -NMR (500 MHz, CD_3OD) Spectrum of Ginsenoside Rb1 (15)

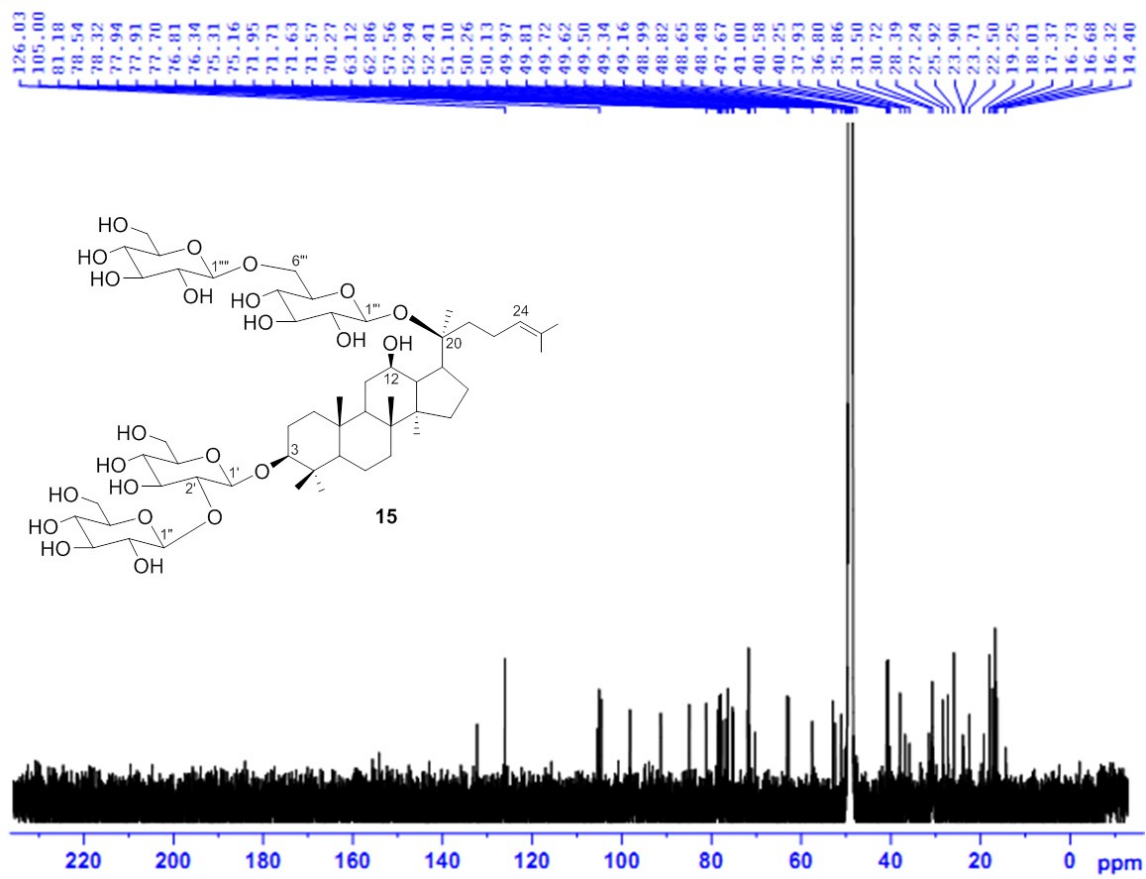


Figure S39: ¹³C-NMR (125 MHz, CD₃OD) Spectrum of Ginsenoside Rb1 (15)

REFERENCES

Research Topic
Author Name
Company Name
Document Identifier
Journal
Patent
Tags

SUBSTANCES

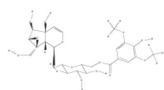
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Molecular Formula
Property
Substance Identifier

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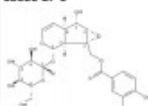
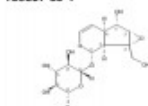
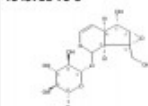
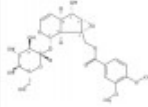
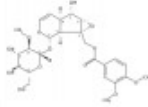
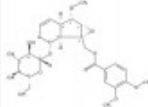
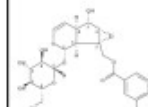
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SciFinder[®] Page 1

<p>Score: 96</p> <p>1. 35988-27-3</p>  <p>Rotation (-), Absolute stereochemistry. C₂₃ H₂₄ O₁₃ β-D-Glucopyranoside, (1a<i>S</i>,1b<i>S</i>,2<i>S</i>,5a<i>R</i>,6<i>S</i>)-1a,1b,2,5a,6,6a-hexahydro-6-hydroxy-1a-[[4-(4-hydroxy-3-methoxybenzoyloxy)methyl]oxireno[4,5]cyclopenta]1,2-dipyran-2-yl</p> <p>Related Info: - 50 References - 7 Commercial Sources Regulatory Information</p>	<p>Score: 96</p> <p>2. 136807-39-1</p>  <p>Absolute stereochemistry. C₂₃ H₂₄ O₁₃ β-D-Glucopyranoside, (1a<i>S</i>,1b<i>S</i>,2<i>S</i>,5a<i>R</i>,6<i>S</i>,6a<i>S</i>)-1a,1b,2,5a,6,6a-hexahydro-6-hydroxy-1a-(hydroxymethyl)oxireno[4,5]cyclopenta[1,2-dipyran-2-yl, 6-(4-hydroxy-3-methoxybenzoate)</p> <p>Related Info: - 2 References</p>	<p>Score: 96</p> <p>3. 1049703-70-9</p>  <p>Absolute stereochemistry. C₂₃ H₂₄ O₁₃ β-D-Glucopyranoside, (1a<i>S</i>,1b<i>S</i>,5a<i>R</i>,6<i>S</i>,6a<i>S</i>)-1a,1b,2,5a,6,6a-hexahydro-6-hydroxy-1a-(hydroxymethyl)oxireno[4,5]cyclopenta[1,2-dipyran-2-yl, 6-(4-hydroxy-3-methoxybenzoate)</p> <p>Related Info: - 1 References</p>	
<p>Score: 96</p> <p>4. 1260253-10-8</p>  <p>Rotation (-), Absolute stereochemistry. C₂₄ H₂₄ O₁₃ β-D-Glucopyranoside, (1a<i>S</i>,1b<i>S</i>,2<i>S</i>,5a<i>R</i>,6<i>S</i>,6a<i>S</i>)-1a-[[3,4-dimethoxybenzoyloxy)methyl]-1a,1b,2,5a,6,6a-hexahydro-6-hydroxyoxireno[4,5]cyclopenta[1,2-dipyran-2-yl</p> <p>Related Info: - 2 References</p>	<p>Score: 95</p> <p>5. 1260253-11-9</p>  <p>Rotation (-), Absolute stereochemistry. C₂₅ H₂₂ O₁₃ β-D-Glucopyranoside, (1a<i>S</i>,1b<i>S</i>,2<i>S</i>,5a<i>R</i>,6<i>S</i>,6a<i>S</i>)-1a-[[3,4-dimethoxybenzoyloxy)methyl]-1a,1b,2,5a,6,6a-hexahydro-6-hydroxyoxireno[4,5]cyclopenta[1,2-dipyran-2-yl 2-O-methyl-</p> <p>Related Info: - 1 References</p>	<p>Score: 95</p> <p>6. 1374308-81-2</p>  <p>Rotation (-), Absolute stereochemistry. C₂₅ H₂₂ O₁₃ β-D-Glucopyranoside, (1a<i>S</i>,1b<i>S</i>,2<i>S</i>,5a<i>R</i>,6<i>S</i>,6a<i>S</i>)-1a-[[3,4-dimethoxybenzoyloxy)-1a,1b,2,5a,6,6a-hexahydro-6-methoxyoxireno[4,5]cyclopenta[1,2-dipyran-2-yl</p> <p>Related Info: - 1 References - 3 Commercial Sources</p>	
			<p>Score: 95</p> <p>7. 1615652-83-9</p>  <p>Rotation (-), Absolute stereochemistry. C₂₂ H₂₆ O₁₃ β-D-Glucopyranoside, (1a<i>S</i>,1b<i>S</i>,2<i>S</i>,5a<i>R</i>,6<i>S</i>,6a<i>S</i>)-1a-[[3,4-dihydroxybenzoyloxy)methyl]-1a,1b,2,5a,6,6a-hexahydro-6-hydroxyoxireno[4,5]cyclopenta[1,2-dipyran-2-yl</p> <p>Related Info: - 1 References</p>

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Figure S40: SciFinder Search Results of Compound 1

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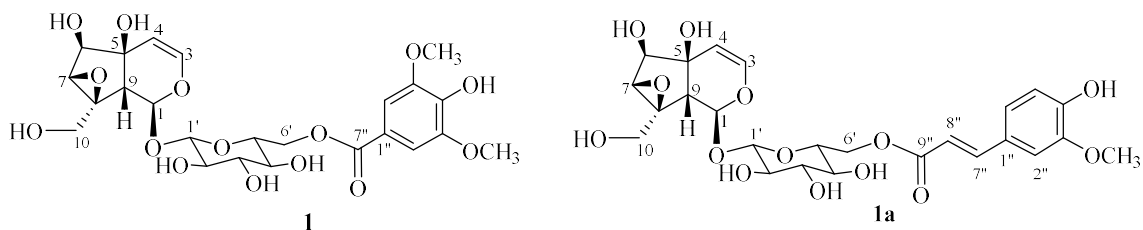


Table S1. ^1H NMR (500 MHz) and ^{13}C NMR (125 MHz) data for compounds **1** and **1a** in CD_3OD

Position	1		1a	
	δ_{C}	δ_{H} (J in Hz)	δ_{C}	δ_{H} (J in Hz)
1	95.5 (CH)	5.13 (1H, d , $J = 9.0$)	95.5 (CH)	5.22 (1H, d , $J = 8.0$)
2	-	-	-	-
3	142.6 (CH)	6.35 (1H, d , $J = 6.0$)	142.8 (CH)	6.35 (1H, d , $J = 6.0$)
4	108.0 (CH)	4.92 (1H, d , $J = 6.0$)	108.0 (CH)	4.89 (1H, d , $J = 6.0$)
5	74.4 (C)	-	74.5 (C)	-
6	78.7 (CH)	3.81 (1H, d , $J = 1.0$)	78.7 (CH)	3.95 (1H, d , $J = 1.0$)
7	63.2 (CH)	3.45 (1H, m)	63.4 (CH)	3.53 (1H, d , $J = 1.0$)
8	66.5 (C)	-	66.8 (C)	-
9	50.9 (CH)	2.55 (1H, d , $J = 9.0$)	51.0 (CH)	2.55 (1H, d , $J = 8.0$)
10	61.5 (CH_2)	4.10 (1H, d , $J = 13.0$) 3.54 (1H, d , $J = 13.0$)	61.6 (CH_2)	4.13 (1H, d , $J = 13.0$) 3.61 (1H, d , $J = 13.0$)
Glc-1'	99.8 (CH)	4.78 (1H, d , $J = 8.0$)	100.0 (CH)	4.73 (1H, d , $J = 8.0$)
2'	74.7 (CH)	3.30 (1H, dd , $J = 9.0, 8.0$)	74.7 (CH)	3.28 (1H, dd , $J = 9.0, 8.0$)
3'	77.5 (CH)	3.45 (1H, m)	77.6 (CH)	3.53 (1H, m)
4'	71.8 (CH)	3.45 (1H, m)	71.7 (CH)	3.40 (1H, m)
5'	76.0 (CH)	3.64 (1H, m)	76.1 (CH)	3.40 (1H, m)
6'	64.4 (CH_2)	4.60 (2H, m)	64.1 (CH_2)	4.50 (1H, dd , $J = 12.0, 2.0$) 4.43 (1H, dd , $J = 12.0, 6.0$)
Acyl-1''	121.3 (C)	-	128.7 (C)	-
2''	108.4 (CH)	7.35 (1H, s)	112.0 (CH)	7.20 (1H, d , $J = 2.0$)
3''	149.0 (C)	-	149.2 (C)	-
4''	142.6 (C)	-	151.1 (C)	-
5''	149.0 (C)	-	116.6 (CH)	6.82 (1H, d , $J = 8.0$)
6''	108.4 (CH)	7.35 (1H, s)	124.3 (CH)	7.09 (1H, dd , $J = 8.0, 2.0$)
7''	167.9 (C)	-	147.2 (CH)	7.63 (1H, d , $J = 16.0$)
8''	-	-	115.4 (CH)	6.38 (1H, d , $J = 16.0$)
9''	-	-	168.9 (C)	-
3''- OCH_3	57.0 (CH_3)	3.92 (3H, s)	56.6 (CH_3)	3.90 (3H, s)
5''- OCH_3	57.0 (CH_3)	3.92 (3H, s)	-	-

1a: Myobontioside B [M. Kanemoto, K. Matsunami, H. Otsuka, T. Shinzato, C. Ishigaki, Y. Takeda (2008). Chlorine-containing iridoid and iridoid glucoside and other glucosides from leaves of *Myoporum bontiodides*, *Phytochemistry*, **69**, 2517-2522.]

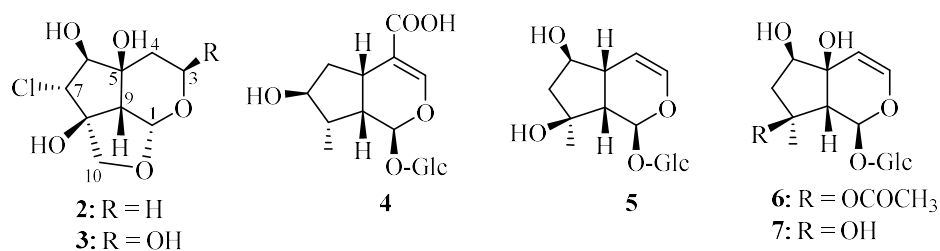


Table S2. ¹³C NMR (125 MHz) data for compounds 2-7

Position	2 ^a	3 ^b	4 ^b	5 ^b	6 ^c	7 ^c
1	101.7	102.0	95.6	93.8	92.4	91.6
3	57.8	90.2	150.0	140.4	141.1	139.8
4	32.1	38.7	-	105.9	107.3	108.5
5	72.8	75.0	31.7	41.3	71.1	69.7
6	76.6	78.6	41.1	77.8	75.6	76.1
7	73.1	71.9	79.4	50.0	44.5	46.9
8	84.1	84.6	45.0	79.5	86.1	75.3
9	55.3	57.6	43.0	51.8	54.2	58.3
10	71.9	73.9	14.3	25.2	22.0	24.7
1'			99.0	99.4	97.1	97.4
2'			74.8	74.8	73.0	72.9
3'			78.3	78.2	77.1	77.1
4'			71.8	71.7	70.1	70.0
5'			78.0	78.0	76.1	76.0
6'			62.9	62.6	61.1	60.9
4-COOH			-			
8-OCOCH ₃					170.1	
					21.9	

^a Recorded in CD₃COCD₃, ^b in CD₃OD, ^c in DMSO-*d*₆

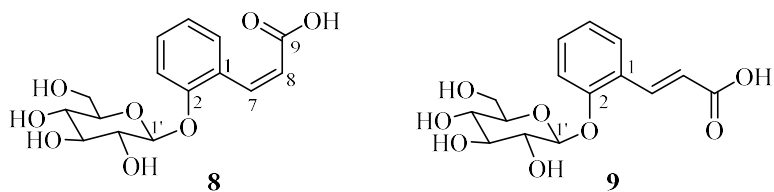


Table S3. ^1H NMR (500 MHz) and ^{13}C NMR (125 MHz) data for compounds **8** and **9** in CD_3OD

Position	8		9	
	δ_{C}	δ_{H} (J in Hz)	δ_{C}	δ_{H} (J in Hz)
1	128.2 (C)	-	125.4	-
2	156.2 (C)	-	157.5	-
3	116.6 (CH)	7.17 (1H, <i>dd</i> , $J = 1.0, 8.0$)	116.9	7.28 (1H, <i>d</i> , $J = 8.0$)
4	129.9 (CH)	7.21 (1H, <i>td</i> , $J = 1.0, 8.0$)	132.8	7.39 (1H, <i>td</i> , $J = 1.5, 8.0$)
5	123.0 (CH)	6.95 (1H, <i>td</i> , $J = 1.0, 8.0$)	123.6	7.07 (1H, <i>t</i> , $J = 8.0$)
6	130.9 (CH)	7.66 (1H, <i>dd</i> , $J = 1.0, 8.0$)	128.8	7.65 (1H, <i>dd</i> , $J = 1.5, 8.0$)
7	128.0 (CH)	6.85 (1H, <i>d</i> , $J = 12.5$)	141.4	8.15 (1H, <i>d</i> , $J = 16.0$)
8	128.4 (CH)	6.08 (1H, <i>d</i> , $J = 12.5$)	119.6	6.56 (1H, <i>d</i> , $J = 16.0$)
9	177.5 (C)	-	171.0	-
1'	102.6 (CH)	4.94 (1H, <i>d</i> , $J = 7.5$)	102.4	5.02 (1H, <i>d</i> , $J = 8.0$)
2'	74.9 (CH)	3.42-3.52 (4H, <i>m</i>)	74.8	3.44-3.59 (4H, <i>m</i>)
3'	78.1 (CH)		78.2	
4'	71.3 (CH)		71.3	
5'	78.0 (CH)		78.1	
6'	62.5 (CH_2)	3.90 (1H, <i>dd</i> , $J = 1.5, 12.0$) 3.72 (1H, <i>m</i>)	62.5	3.92 (1H, <i>dd</i> , $J = 2.0, 12.0$) 3.73 (1H, <i>dd</i> , $J = 5.0, 12.0$)

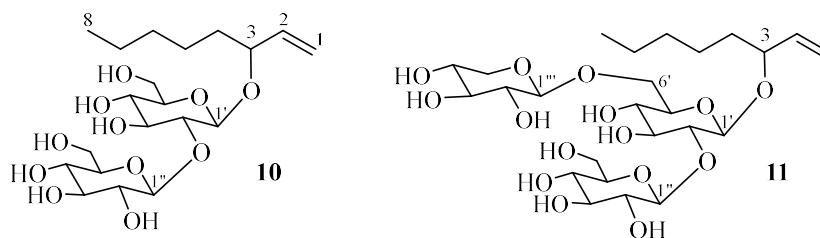


Table S4. ^1H NMR (500 MHz) and ^{13}C NMR (125 MHz) data for compounds **10** and **11** in CD_3OD

Position	10		11	
	δ_{C}	δ_{H} (J in Hz)	δ_{C}	δ_{H} (J in Hz)
1	116.1 (CH ₂)	5.33 (1H, <i>brd</i> , $J = 17.5$) 5.24 (1H, <i>brd</i> , $J = 10.5$)	116.8	5.26 (1H, <i>brd</i> , $J = 17.0$) 5.17 (1H, <i>brd</i> , $J = 10.5$)
2	140.8 (CH)	5.99 (1H, <i>ddd</i> , $J = 7.0, 10.5, 17.5$)	140.6	5.90 (1H, <i>ddd</i> , $J = 6.5, 10.5, 17.0$)
3	83.9 (CH)	4.25 (1H, <i>q</i> , $J = 7.0$)	83.7	4.17 (1H, <i>q</i> , $J = 6.5$)
4	35.7 (CH ₂)	1.81 (1H, <i>m</i>), 1.62 (1H, <i>m</i>)	35.8	1.70 (1H, <i>m</i>), 1.53 (1H, <i>m</i>)
5	25.6 (CH ₂)	1.48 (6H, <i>m</i>)	25.6	1.37 (6H, <i>m</i>)
6	33.0 (CH ₂)		33.0	
7	23.6 (CH ₂)		23.7	
8	14.4 (CH ₃)	1.01 (3H, <i>t</i> , $J = 6.5$)	14.4	0.92 (3H, <i>t</i> , $J = 6.5$)
Glc-1'	101.7 (CH)	4.55 (1H, <i>d</i> , $J = 8.0$)	101.8	4.46 (1H, <i>d</i> , $J = 7.5$)
2'	82.5 (CH)	3.59 (1H, <i>dd</i> , $J = 8.0, 9.0$)	82.4	3.51 (1H, <i>m</i>)
3'	78.1 (CH)	3.66 (1H, <i>d</i> , $J = 9.0$)	77.9*	
4'	71.6* (CH)	3.41 (1H, <i>m</i>)	71.1*	
5'	77.7 (CH)	3.49 (1H, <i>m</i>)	77.5*	
6'	62.9* (CH ₂)	3.96 (1H, <i>brd</i> , $J = 12.0$) 3.79 (1H, <i>m</i>)	69.4	4.05 (1H, <i>d</i> , $J = 11.0$) 3.74 (1H, <i>m</i>)
Glc-1''	104.9 (CH)	4.75 (1H, <i>d</i> , $J = 8.0$)	104.9	4.65 (1H, <i>d</i> , $J = 7.5$)
2''	76.1 (CH)	3.34 (1H, <i>m</i>)	76.1	
3''	78.2 (CH)	3.43 (1H, <i>m</i>)	78.2	
4''	71.4* (CH)	3.41 (1H, <i>m</i>)	71.2*	
5''	77.7 (CH)	3.49 (1H, <i>m</i>)	77.7*	
6''	62.6* (CH ₂)	3.92 (1H, <i>dd</i> , $J = 2.0, 11.5$) 3.76 (1H, <i>m</i>)	62.9	3.88 (1H, <i>m</i>), 3.74 (1H, <i>m</i>)
Xyl-1'''			105.2	4.35 (1H, <i>d</i> , $J = 7.5$)
2'''			74.8	
3'''			77.5*	
4'''			71.6	
5'''			66.8	3.88 (1H, <i>m</i>), 3.20 (1H, <i>m</i>)

* Assignments may be interchanged in each column

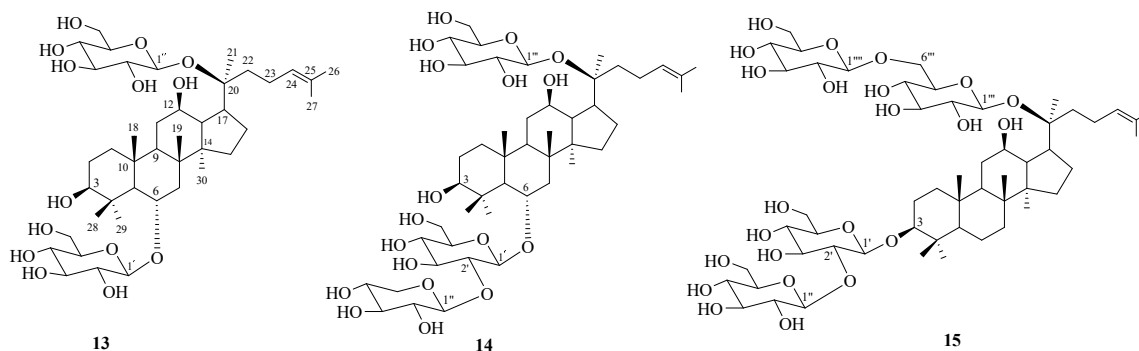


Table S5. ^1H NMR (500 MHz) and ^{13}C NMR (125 MHz) data for compounds **13-15** in CD_3OD

C	13		14		15	
	δ_{C}	δ_{H} (J in Hz)	δ_{C}	δ_{H} (J in Hz)	δ_{C}	δ_{H} (J in Hz)
1	40.2	1.76 (1H, <i>m</i>), 1.08 (1H, <i>m</i>)	40.2	1.74 (1H, <i>m</i>), 1.07 (1H, <i>m</i>)	40.2	1.76 (1H, <i>m</i>), 1.06 (1H, <i>m</i>)
2	27.6	1.66 (1H, <i>m</i>), 1.61 (1H, <i>m</i>)	27.5	1.64 (2H, <i>m</i>)	27.2	2.01 (1H, <i>m</i>), 1.76 (1H, <i>m</i>)
3	79.9	3.13 (1H, <i>m</i>)	79.6	3.66 (1H, <i>m</i>)	91.3	3.20 (1H, <i>m</i>)
4	40.5	-	40.5	-	40.6	-
5	61.8	1.15 (1H, <i>m</i>)	61.9	1.13 (1H, <i>m</i>)	57.6	0.81 (1H, <i>m</i>)
6	80.9	4.13 (1H, <i>td</i> , <i>J</i> = 3.0, 10.5)	80.7	4.11 (1H, <i>td</i> , <i>J</i> = 3.0, 10.5)	19.2	1.61 (1H, <i>m</i>), 1.58 (1H, <i>m</i>)
7	45.3	2.05 (1H, <i>m</i>), 1.66 (1H, <i>m</i>)	45.2	1.68 (1H, <i>m</i>), 2.03 (1H, <i>m</i>)	35.8	1.56 (1H, <i>m</i>), 1.26 (1H, <i>m</i>)
8	41.9	-	41.9	-	41.0	-
9	50.6	1.49 (1H, <i>m</i>)	50.6	1.50 (1H, <i>m</i>)	51.1	1.47 (1H, <i>m</i>)
10	40.4	-	40.4	-	37.9	-
11	30.9	1.59 (1H, <i>m</i>), 1.15 (1H, <i>m</i>)	30.9	1.85 (1H, <i>m</i>), 1.18 (1H, <i>m</i>)	30.7	1.82 (1H, <i>m</i>), 1.26 (1H, <i>m</i>)
12	71.7	3.66 (1H, <i>m</i>)	71.7	3.65 (1H, <i>m</i>)	71.7	3.74 (1H, <i>m</i>)
13	49.5	1.76 (1H, <i>m</i>)	49.5	1.77 (1H, <i>m</i>)	49.8	1.76 (1H, <i>m</i>)
14	52.4	-	52.5	-	52.4	-
15	31.5	1.65 (1H, <i>m</i>), 1.15 (1H, <i>m</i>)	31.5	1.64 (1H, <i>m</i>), 1.18 (1H, <i>m</i>)	31.5	1.61 (1H, <i>m</i>), 1.06 (1H, <i>m</i>)
16	27.2	1.95 (1H, <i>m</i>), 1.42 (1H, <i>m</i>)	27.2	1.95 (1H, <i>m</i>), 1.42 (1H, <i>m</i>)	27.2	2.01 (1H, <i>m</i>), 1.76 (1H, <i>m</i>)
17	53.1	2.31 (1H, <i>m</i>)	53.1	2.31 (1H, <i>m</i>)	52.9	2.32 (1H, <i>m</i>)
18	17.6	1.12 (3H, <i>s</i>)	17.6	1.11 (3H, <i>s</i>)	16.3	1.03 (3H, <i>s</i>)
19	17.8	1.01 (3H, <i>s</i>)	17.8	1.01 (3H, <i>s</i>)	16.7	0.94 (3H, <i>s</i>)
20	84.9	-	84.9	-	85.0	-
21	22.8	1.36 (3H, <i>s</i>)	22.8	1.36 (3H, <i>s</i>)	22.5	1.33 (3H, <i>s</i>)
22	36.6	1.97 (1H, <i>m</i>), 1.66 (1H, <i>m</i>)	36.6	1.84 (1H, <i>m</i>), 1.66 (1H, <i>m</i>)	36.8	1.82 (1H, <i>m</i>), 1.58 (1H, <i>m</i>)
23	24.2	2.11 (2H, <i>m</i>)	24.2	2.10 (2H, <i>q</i> , <i>J</i> = 8.0)	23.9	2.15 (1H, <i>m</i>), 2.07 (1H, <i>m</i>)
24	125.8	5.13 (1H, <i>t</i> , <i>J</i> = 7.0)	125.8	5.12 (1H, <i>t</i> , <i>J</i> = 7.0)	126.0	5.16 (1H, <i>t</i> , <i>J</i> = 7.0)
25	132.3	-	132.3	-	132.0	-
26	25.8	1.70 (3H, <i>s</i>)	25.8	1.70 (3H, <i>s</i>)	25.9	1.71 (3H, <i>s</i>)
27	17.9	1.64 (3H, <i>s</i>)	17.9	1.64 (3H, <i>s</i>)	18.0	1.65 (3H, <i>s</i>)
28	31.4	1.35 (3H, <i>s</i>)	31.4	1.34 (3H, <i>s</i>)	28.4	1.09 (3H, <i>s</i>)
29	16.5	1.02 (3H, <i>s</i>)	16.5	1.00 (3H, <i>s</i>)	16.6	0.88 (3H, <i>s</i>)
30	17.1	0.97 (3H, <i>s</i>)	17.1	0.97 (3H, <i>s</i>)	17.4	0.94 (3H, <i>s</i>)
1'	105.5	4.38 (1H, <i>d</i> , <i>J</i> = 7.5)	103.8	4.47 (1H, <i>d</i> , <i>J</i> = 7.0)	105.4	4.46 (1H, <i>d</i> , <i>J</i> = 8.0)
2'	75.5	-	79.3	-	81.2	-
3'	77.7	-	78.2	-	78.3	-
4'	71.8	-	71.3	-	71.5	-
5'	79.1	-	80.1	-	77.9	-
6'	62.9	-	62.9	-	62.9	-

1"	98.3	4.63 (1H, <i>d</i> , <i>J</i> = 8.0)	103.8	4.90 (1H, <i>d</i> , <i>J</i> = 6.0)	104.5	4.70 (1H, <i>d</i> , <i>J</i> = 8.0)
2"	75.4		75.5		76.8	
3"	77.9		77.6		78.3	
4"	71.2		71.9		71.6	
5"	78.2		66.9		78.5	
6"	62.5		-		63.1	
1'''			98.3	4.63 (1H, <i>d</i> , <i>J</i> = 8.0)	98.1	4.61 (1H, <i>d</i> , <i>J</i> = 8.0)
2'''			75.4		75.1	
3'''			77.9		77.9	
4'''			71.2		71.6	
5'''			78.2		76.3	
6'''			62.5		70.3	
1''''					105.0	4.38 (1H, <i>d</i> , <i>J</i> = 8.0)
2''''					75.3	
3''''					77.7	
4''''					71.9	
5''''					78.5	
6''''					62.9	
