



Supplementary Materials

Three New Isoflavonoid Glycosides from Mangrove-Derived Actinomycete *Micromonospora aurantiaca* 110B

Rui-Jun Wang ¹, Shao-Yong Zhang ³, Yang-Hui Ye ¹, Zhen Yu ³, Huan Qi ³, Hui Zhang ^{2,3}, Zheng-Lian Xue ², Ji-Dong Wang ^{2,3,*} and Min Wu ^{1,*}

¹ Ocean College, Zhejiang University, Zhoushan 316021, China; 15034663445@163.com (R.-J.W.); 1593591913@qq.com (Y.-H.Y.)

² College of Biochemical Engineering, Anhui Polytechnic University, Wuhu 241000, China; xuezhen0851@sina.com (Z.-L.X.)

³ Zhejiang Key Laboratory of Antifungal Drugs, Zhejiang Hisun Pharmaceutical Co., Ltd., Taizhou 318000, China; 1zhangshaoyong@163.com (S.-Y.Z.); yuzhen@hisunpharm.com (Z.Y.); qihuan@hisunpharm.com (H.Q.); huizhang@hisunpharm.com (H.Z.)

* Correspondence: jdwang@hisunpharm.com (J.-D.W.); wumin@zju.edu.cn (M. W); Tel.: +86-136-3400-5685 (J.-D.W.); +86-136-1651-0066 (M.W.)

Contents

Figure S1. HR-ESIMS data of compound 1	3
Figure S2. The IR spectrum of compound 1	4
Figure S3. ¹ H NMR spectrum of compound 1 in CD ₃ OD (600 MHz).....	4
Figure S4. ¹³ C NMR spectrum of compound 1 in CD ₃ OD (400 MHz)	5
Figure S5. The DEPT spectrum of compound 1 in CD ₃ OD (400 MHz)	5
Figure S6. The HSQC spectrum of compound 1 in CD ₃ OD (400 MHz)	6
Figure S7. The ¹ H- ¹ H COSY spectrum of compound 1 in CD ₃ OD (400 MHz).....	6
Figure S8. The HMBC spectrum of compound 1 in CD ₃ OD (400 MHz)	7
Figure S9. The NOESY spectrum of compound 1 in CD ₃ OD (600 MHz)	7
Figure S10. HR-ESIMS data of compound 2	8
Figure S11. The IR spectrum of compound 2	9
Figure S12. The ¹ H NMR spectrum of compound 2 in CD ₃ OD (400 MHz)	9
Figure S13. The ¹³ C NMR spectrum of compound 2 in CD ₃ OD (400 MHz).....	10
Figure S14. The DEPT spectrum of compound 2 in CD ₃ OD (400 MHz)	10
Figure S15. The HSQC spectrum of compound 2 in CD ₃ OD (400 MHz)	11
Figure S16. The ¹ H- ¹ H COSY spectrum of compound 2 in CD ₃ OD (400 MHz).....	11
Figure S17. The HMBC spectrum of compound 2 in CD ₃ OD (400 MHz)	12
Figure S18. The NOESY spectrum of compound 2 in CD ₃ OD (600 MHz)	12
Figure S19. HR-ESIMS data of compound 3	13
Figure S20. The IR spectrum of compound 3	14
Figure S21. ¹ H NMR spectrum of compound 3 in CD ₃ OD (400 MHz).....	14
Figure S22. ¹³ C NMR spectrum of compound 3 in CD ₃ OD (400 MHz)	15
Figure S23. The DEPT spectrum of compound 3 in CD ₃ OD (400 MHz)	15
Figure S24. The HSQC spectrum of compound 3 in CD ₃ OD (400 MHz)	16
Figure S25. The ¹ H- ¹ H COSY spectrum of compound 3 in CD ₃ OD (400 MHz).....	16
Figure S26. The HMBC spectrum of compound 3 in CD ₃ OD (400 MHz)	17
Figure S27. The NOESY spectrum of compound 3 in CD ₃ OD (600 MHz).....	17
Figure S28. The retention time of the aglycone moieties of daidzein and compounds 1-3	18
Figure S29. The retention time of the <i>O</i> -tolylthiocarbamate derivatives of 2-deoxy-L-fucose and the liberated sugars of compounds 1-3	18

Best	ID Source	Formula	Species	m/z	Score	Diff (ppm)	Score (M)	Mass (MFG)																																																		
	MFG	C21 H20 O7	(M+H)+	385.1286	98.97	-0.95	98.97	384.1209																																																		
<table border="1"> <thead> <tr> <th>Species</th> <th>m/z</th> <th>Score (iso. stand)</th> <th>Score (mass)</th> <th>Score (MFG)</th> <th>Score (MS)</th> <th>Score (MFG)</th> <th>Score (iso)</th> <th>Height</th> <th>Ion Formula</th> </tr> </thead> <tbody> <tr> <td>(M+H)+</td> <td>385.1286</td> <td>98.08</td> <td>99.24</td> <td>98.97</td> <td>98.97</td> <td>98.97</td> <td>99.5</td> <td>801604.1</td> <td>C21 H21 O7</td> </tr> </tbody> </table>									Species	m/z	Score (iso. stand)	Score (mass)	Score (MFG)	Score (MS)	Score (MFG)	Score (iso)	Height	Ion Formula	(M+H)+	385.1286	98.08	99.24	98.97	98.97	98.97	99.5	801604.1	C21 H21 O7																														
Species	m/z	Score (iso. stand)	Score (mass)	Score (MFG)	Score (MS)	Score (MFG)	Score (iso)	Height	Ion Formula																																																	
(M+H)+	385.1286	98.08	99.24	98.97	98.97	98.97	99.5	801604.1	C21 H21 O7																																																	
<table border="1"> <thead> <tr> <th>Height (C)</th> <th>Height (S)</th> <th>Height % (Calc)</th> <th>m/z (Calc)</th> <th>Diff (mDa)</th> <th>Height</th> <th>Height %</th> <th>Height (S)</th> <th>m/z</th> <th>Diff (ppm)</th> </tr> </thead> <tbody> <tr> <td>787123.6</td> <td>78.3</td> <td>100</td> <td>385.1282</td> <td>-0.4</td> <td>801604.1</td> <td>100</td> <td>79.7</td> <td>385.1286</td> <td>-1.08</td> </tr> <tr> <td>182779.6</td> <td>18.2</td> <td>23.2</td> <td>386.1316</td> <td>-0.1</td> <td>173537.8</td> <td>21.6</td> <td>17.3</td> <td>386.1317</td> <td>-0.23</td> </tr> <tr> <td>31577.2</td> <td>3.1</td> <td>4</td> <td>387.1341</td> <td>-0.6</td> <td>26483.1</td> <td>3.3</td> <td>2.6</td> <td>387.1346</td> <td>-1.51</td> </tr> <tr> <td>4050</td> <td>0.4</td> <td>0.5</td> <td>388.1367</td> <td>-0.6</td> <td>3905.4</td> <td>0.5</td> <td>0.4</td> <td>388.1373</td> <td>-1.43</td> </tr> </tbody> </table>									Height (C)	Height (S)	Height % (Calc)	m/z (Calc)	Diff (mDa)	Height	Height %	Height (S)	m/z	Diff (ppm)	787123.6	78.3	100	385.1282	-0.4	801604.1	100	79.7	385.1286	-1.08	182779.6	18.2	23.2	386.1316	-0.1	173537.8	21.6	17.3	386.1317	-0.23	31577.2	3.1	4	387.1341	-0.6	26483.1	3.3	2.6	387.1346	-1.51	4050	0.4	0.5	388.1367	-0.6	3905.4	0.5	0.4	388.1373	-1.43
Height (C)	Height (S)	Height % (Calc)	m/z (Calc)	Diff (mDa)	Height	Height %	Height (S)	m/z	Diff (ppm)																																																	
787123.6	78.3	100	385.1282	-0.4	801604.1	100	79.7	385.1286	-1.08																																																	
182779.6	18.2	23.2	386.1316	-0.1	173537.8	21.6	17.3	386.1317	-0.23																																																	
31577.2	3.1	4	387.1341	-0.6	26483.1	3.3	2.6	387.1346	-1.51																																																	
4050	0.4	0.5	388.1367	-0.6	3905.4	0.5	0.4	388.1373	-1.43																																																	
Best	ID Source	Formula	Species	m/z	Score	Diff (ppm)	Score (M)	Mass (MFG)																																																		
	MFG	C20 H14 N7 O2	(M+H)+	385.1286	97.47	-1.32	97.47	384.1209																																																		
	MFG	C22 H16 N4 O3	(M+H)+	385.1286	94.88	2.35	94.88	384.1222																																																		
	MFG	C19 H18 N3 O6	(M+H)+	385.1286	92	-4.62	92	384.1196																																																		
	MFG	C14 H20 N6 O5 S	(M+H)+	385.1286	90.2	-0.12	90.2	384.1216																																																		
	MFG	C18 H12 N10 O	(M+H)+	385.1286	89.39	-5.01	89.39	384.1196																																																		
	MFG	C15 H16 N10 O S	(M+H)+	385.1286	88.74	3.16	88.74	384.1229																																																		

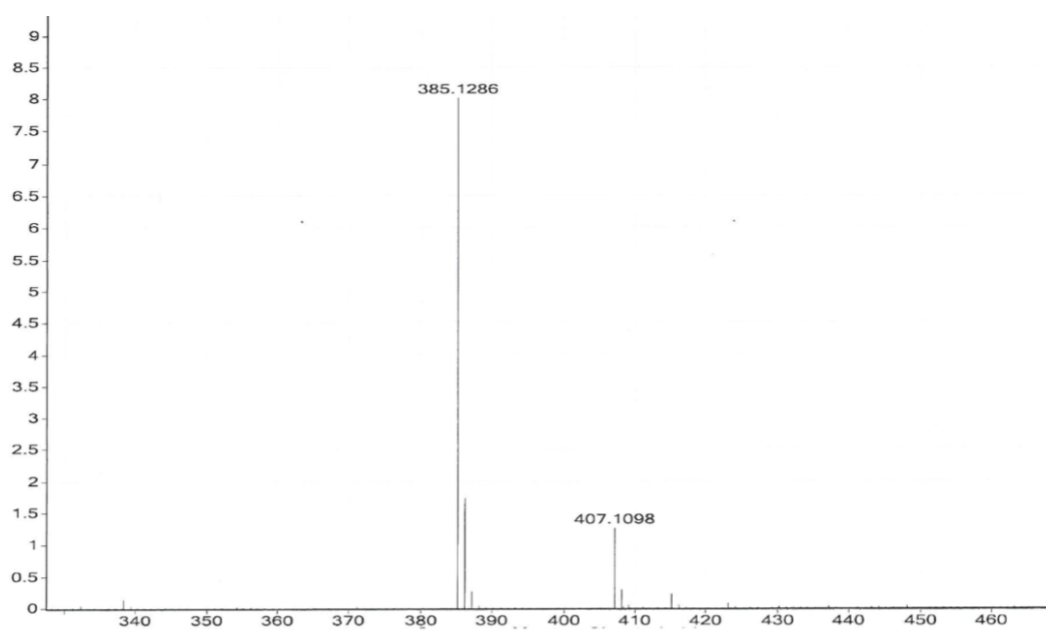


Figure S1. HR-ESIMS data of compound 1

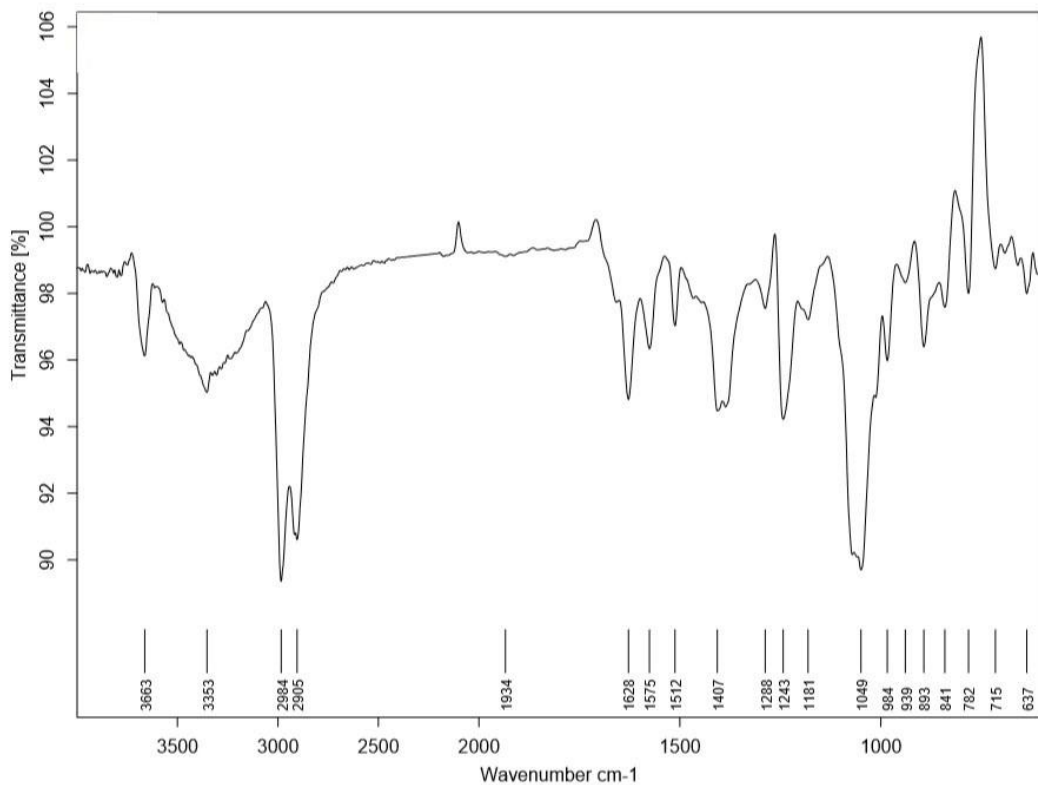


Figure S2. The IR spectrum of compound **1**

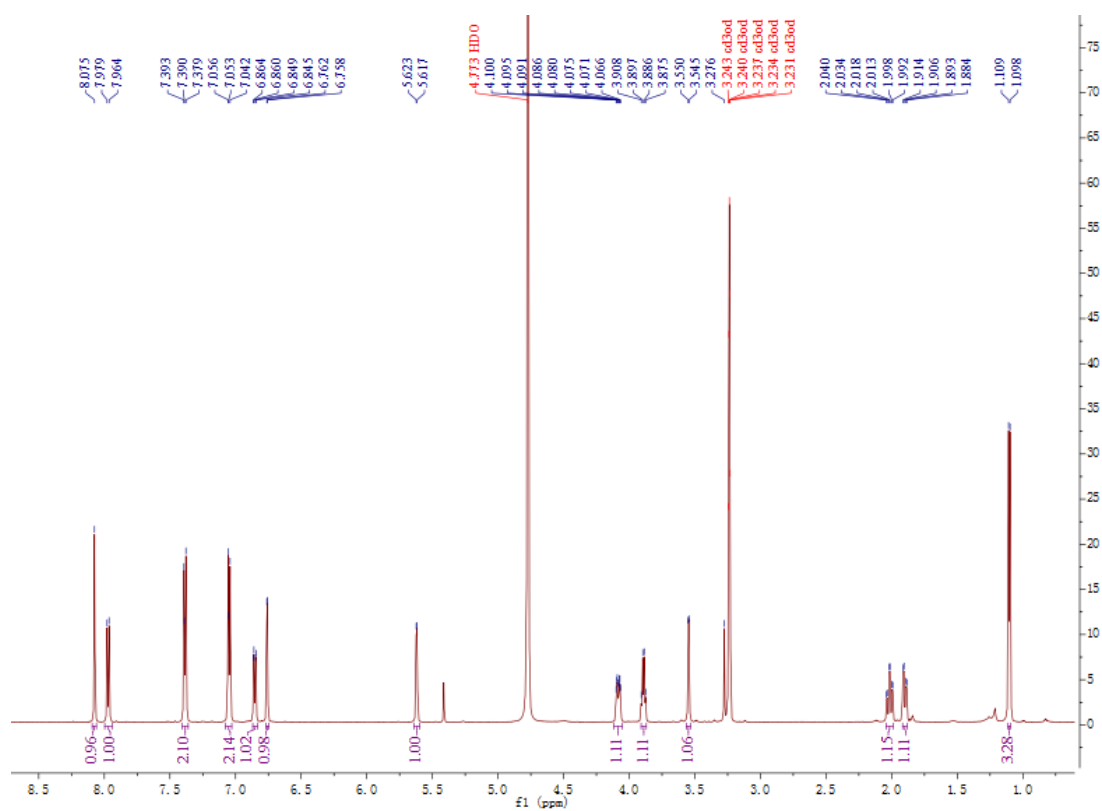


Figure S3. ¹H NMR spectrum of compound **1** in CD₃OD (600 MHz)

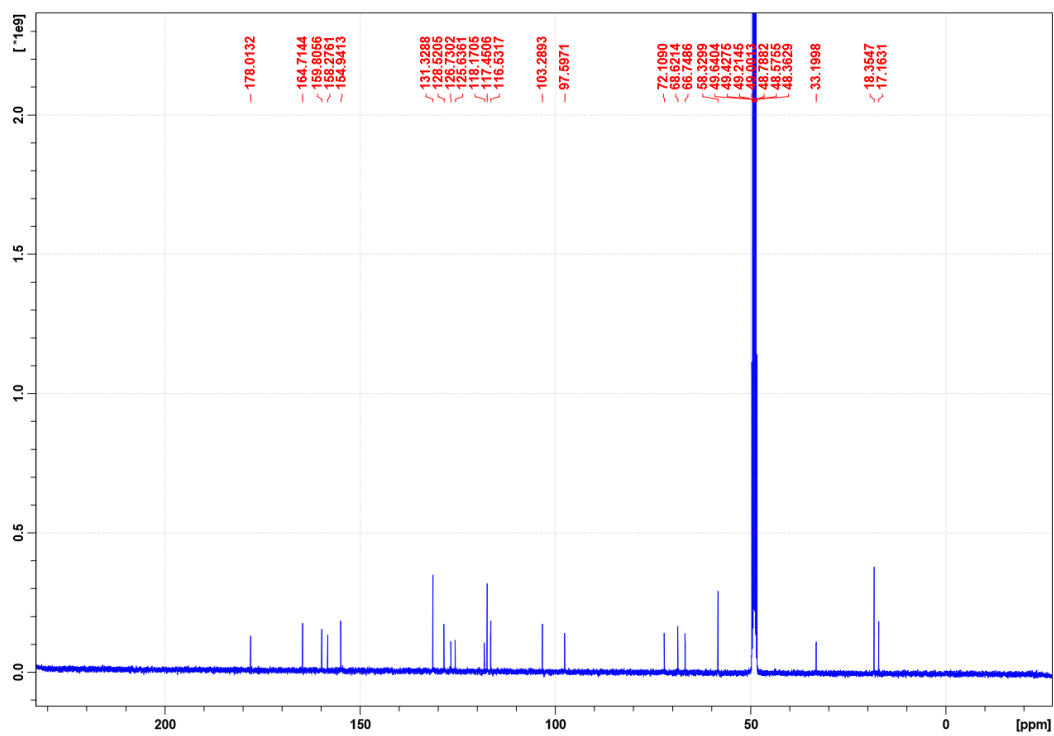


Figure S4. ^{13}C NMR spectrum of compound 1 in CD_3OD (400 MHz)

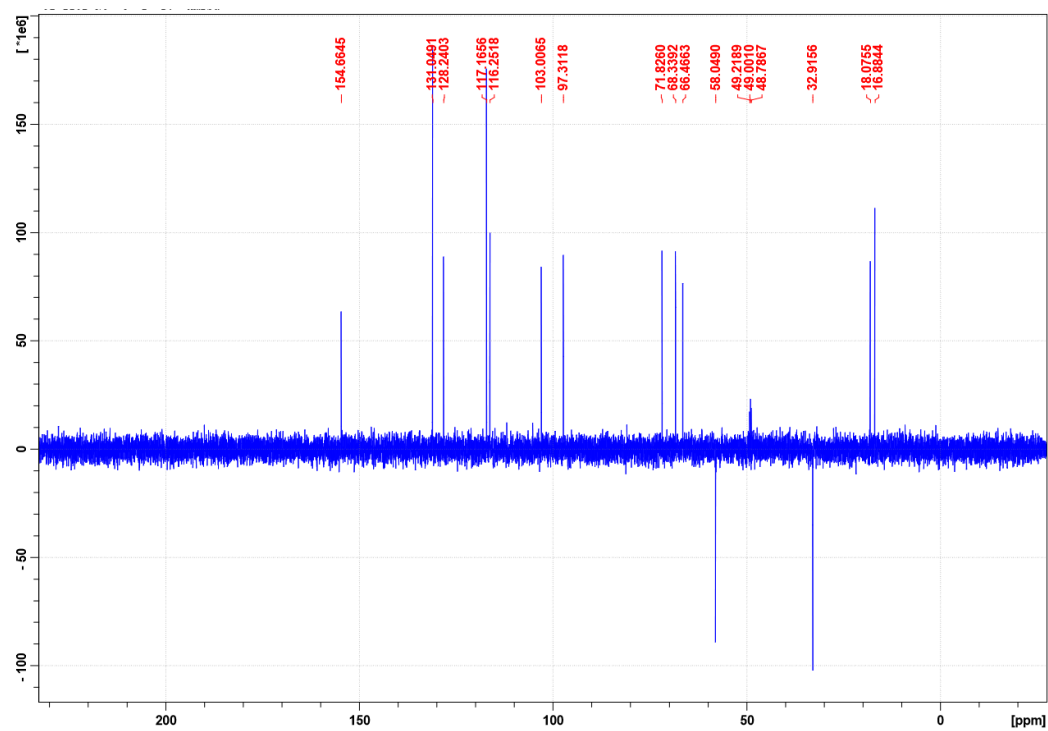


Figure S5. The DEPT spectrum of compound 1 in CD_3OD (400 MHz)

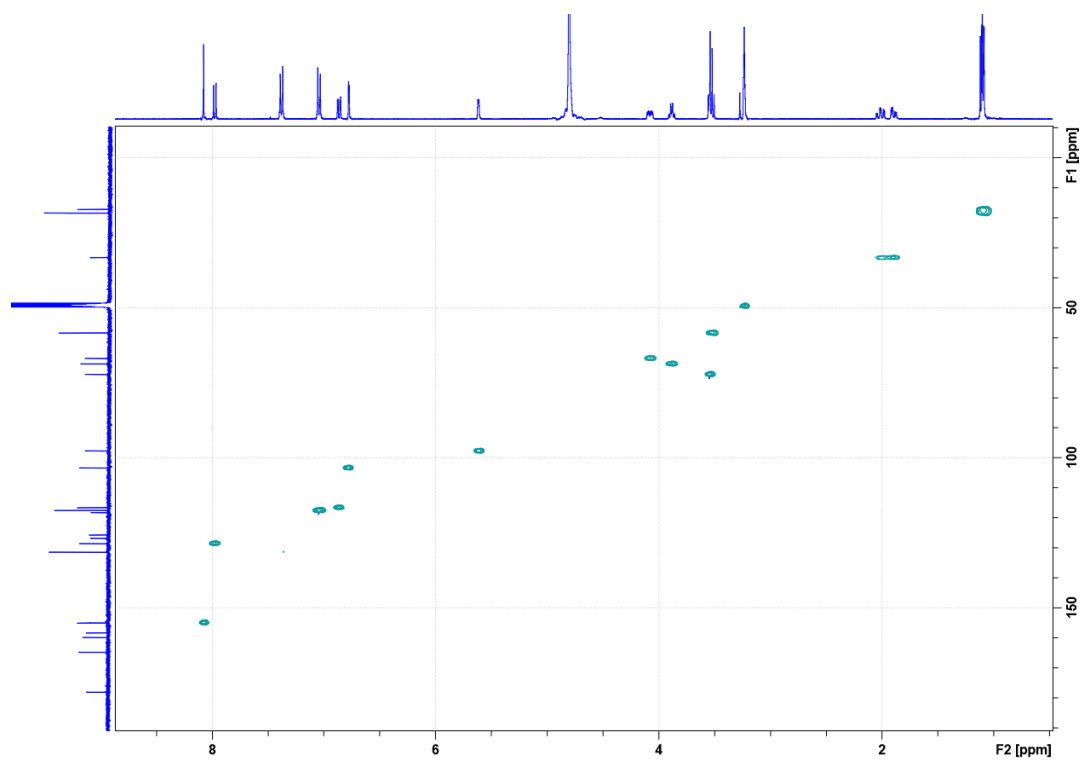


Figure S6. The HSQC spectrum of compound **1** in CD₃OD (400 MHz)

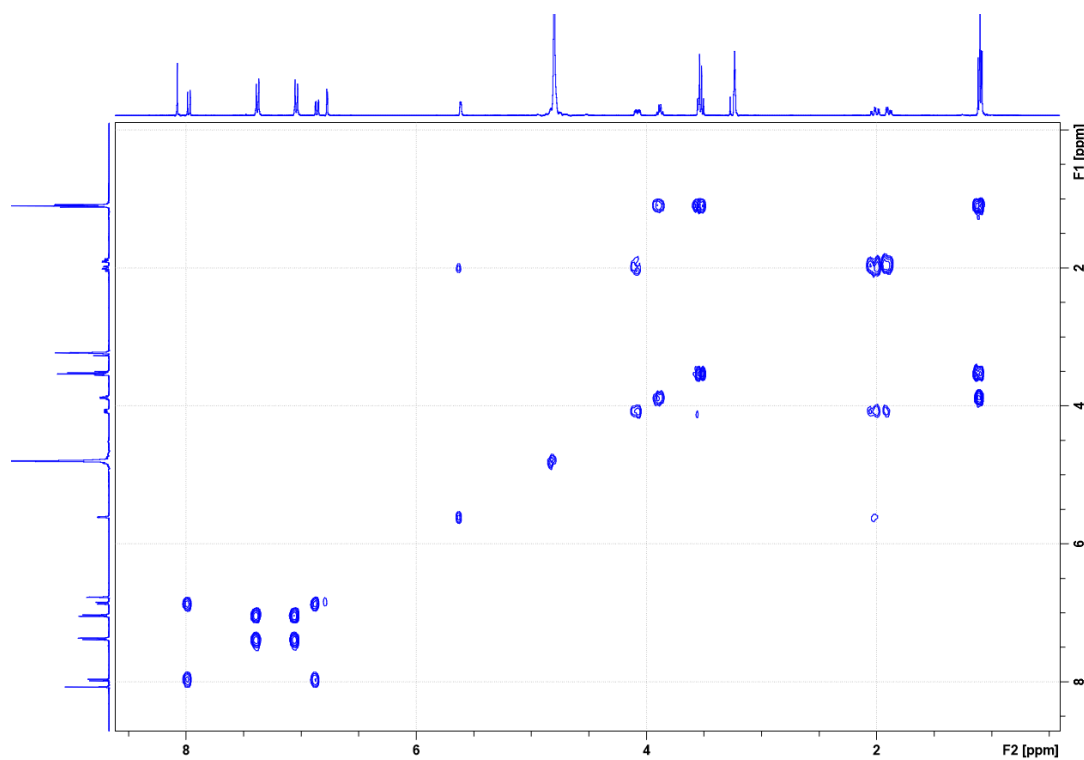


Figure S7. The ¹H-¹H COSY spectrum of compound **1** in CD₃OD (400 MHz)

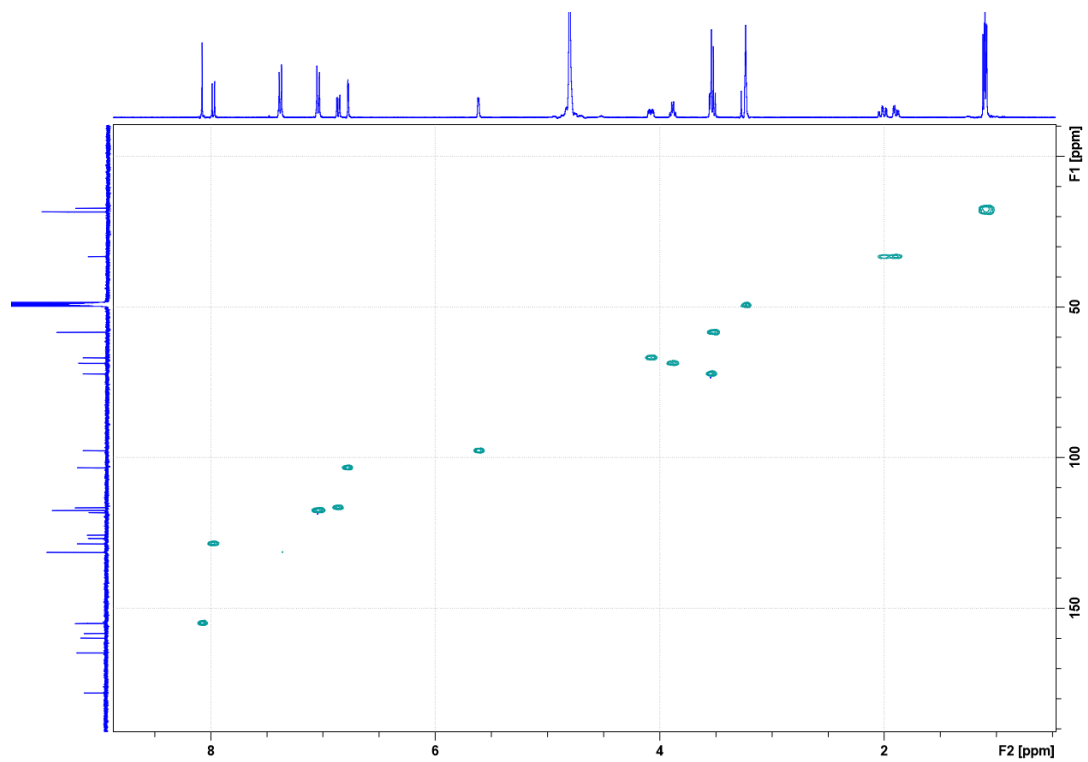


Figure S8. The HMBC spectrum of compound **1** in CD₃OD (400 MHz)

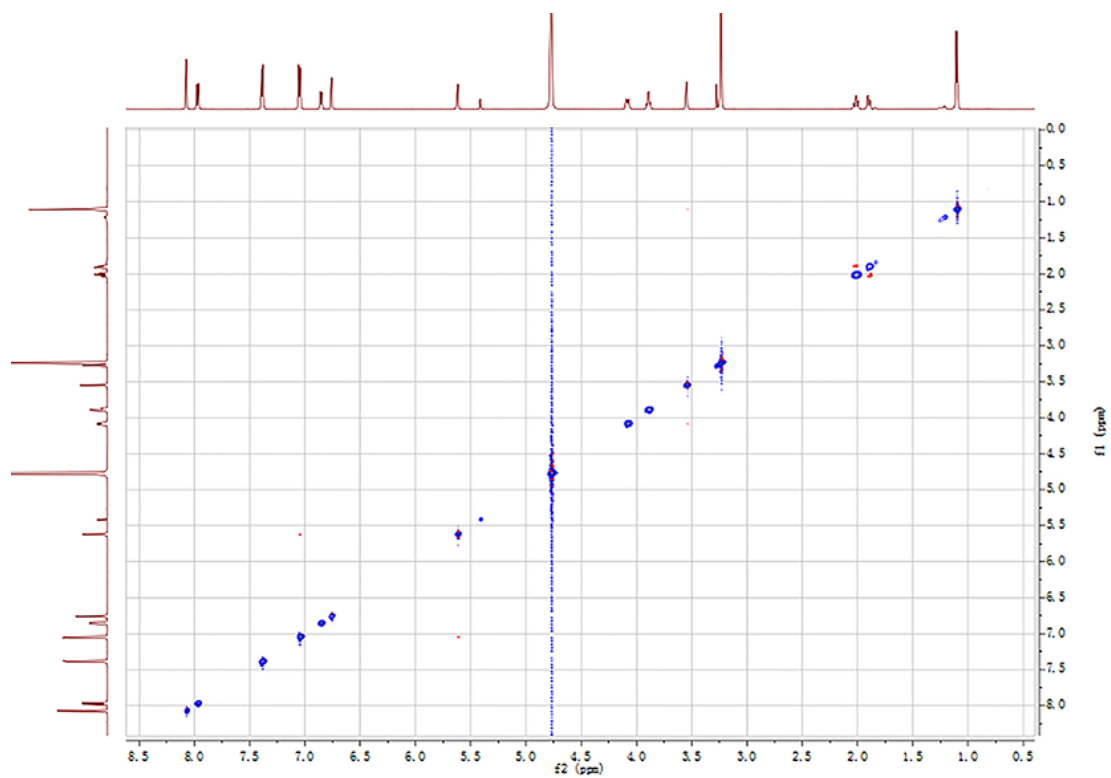


Figure S9. The NOESY spectrum of compound **1** in CD₃OD (600 MHz)

Spectrum Identification Results: + Scan (rt: 0.165 min) Sub (110B-N7.d)

Best	ID Source	Formula	Species	m/z	Score	Diff (ppm)	Score (MFG)	Mass (MFG)		
	MFG	C21 H20 O7	(M+H) ⁺	385.1287	98.45	-1.27	98.45	384.1209		
Species										
	m/z	Score (iso. abund)	Score (mass)	Score (MFG)	Score (MS)	Score (MFG)	Score (lit. spec)	Height	Ion Formula	
(M+H) ⁺	385.1287	97.71	98.64	98.45	98.45	98.45	98.98	506509.2	C21 H21 O7	
Height (Calc)										
	Height S	Height % (Calc)	m/z (Calc)	Diff (ppm)	Height	Height %	Height Sum %	m/z	Diff (ppm)	
	497440.6	78.3	100	385.1282	-0.6	506509.2	100	79.7	385.1287	-1.43
	115511.7	18.2	23.2	386.1316	-0.1	108520.3	21.4	17.1	386.1317	-0.21
	19955.9	3.1	4	387.1341	-0.5	17854.8	3.5	2.8	387.1346	-1.34
	2559.5	0.4	0.5	388.1367	-4.8	2583.3	0.5	0.4	388.1415	-12.37
Best										
	ID Source	Formula	Species	m/z	Score	Diff (ppm)	Score (MFG)	Mass (MFG)		
	MFG	C20 H14 N7 O2	(M+H) ⁺	385.1287	96.83	-1.64	96.83	384.1209		
	MFG	C22 H16 N4 O3	(M+H) ⁺	385.1287	95.03	2.03	95.03	384.1222		
	MFG	C19 H18 N3 O6	(M+H) ⁺	385.1287	90.91	-4.94	90.91	384.1196		
	MFG	C14 H20 N6 O5 S	(M+H) ⁺	385.1287	90.9	-0.47	90.9	384.1216		
	MFG	C15 H16 N10 O S	(M+H) ⁺	385.1287	90.18	2.81	90.18	384.1229		
	MFG	C18 H12 N10 O	(M+H) ⁺	385.1287	88.2	-5.33	88.2	384.1196		

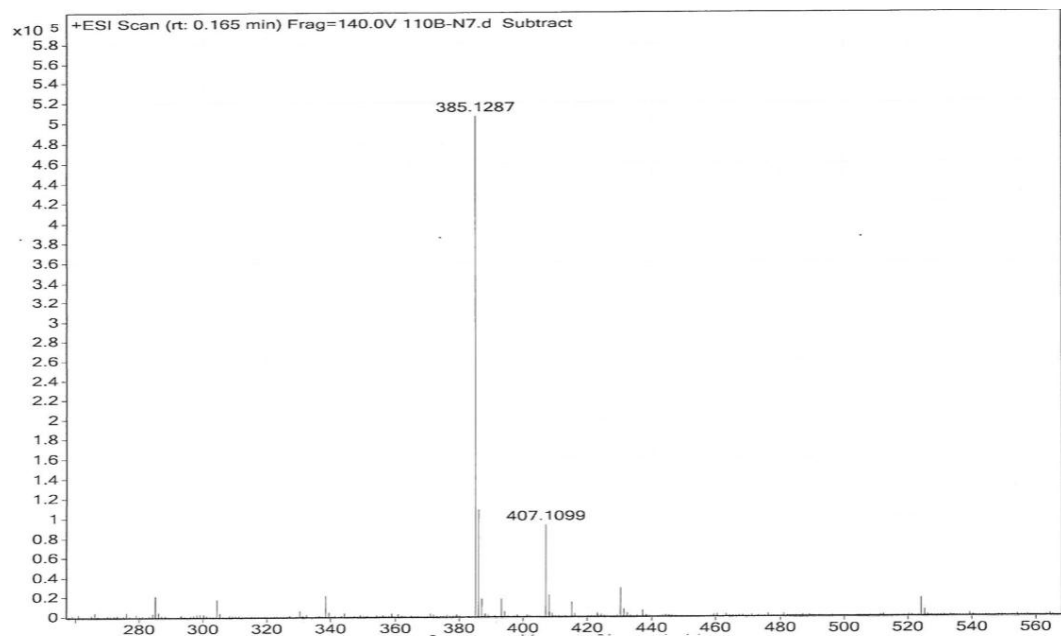


Figure S10. HR-ESIMS data of compound 2

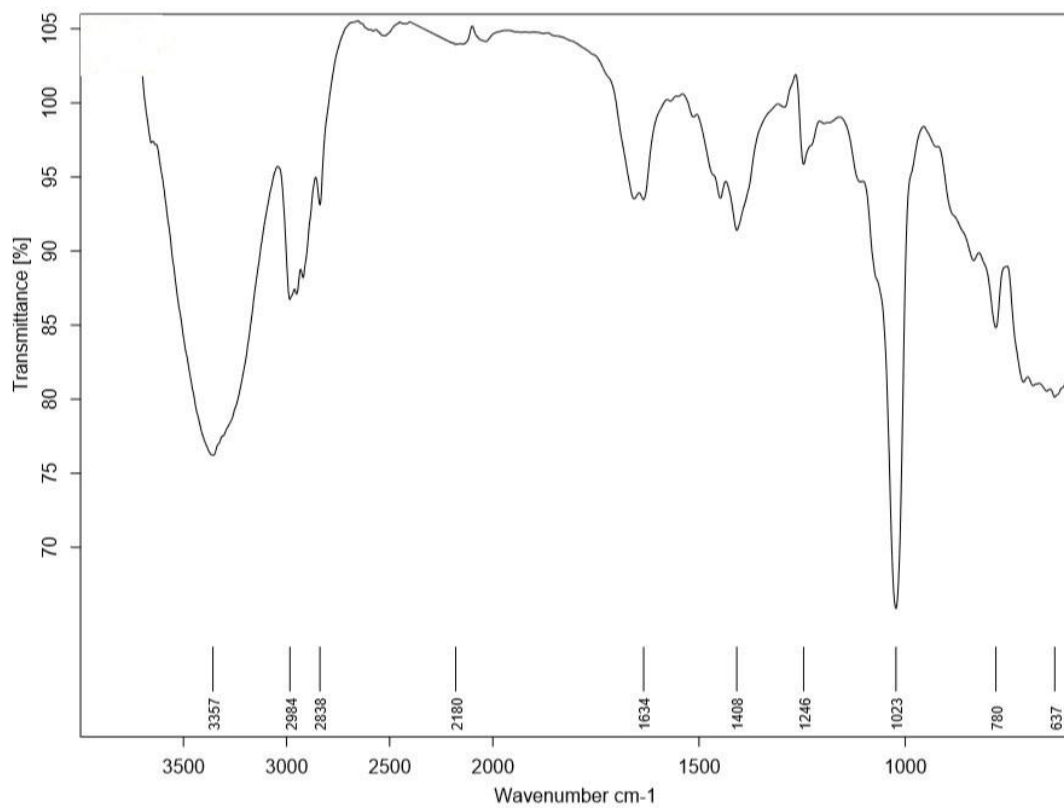


Figure S11. The IR spectrum of compound **2**

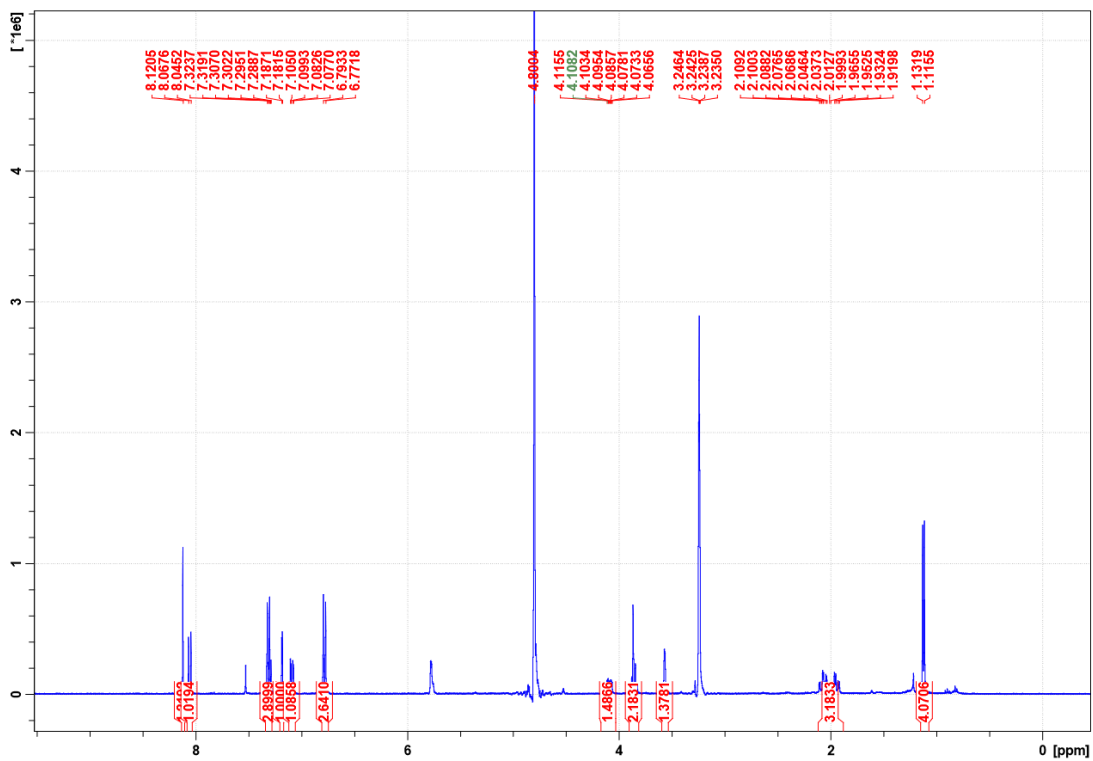


Figure S12. The ^1H NMR spectrum of compound **2** in CD_3OD (400 MHz)

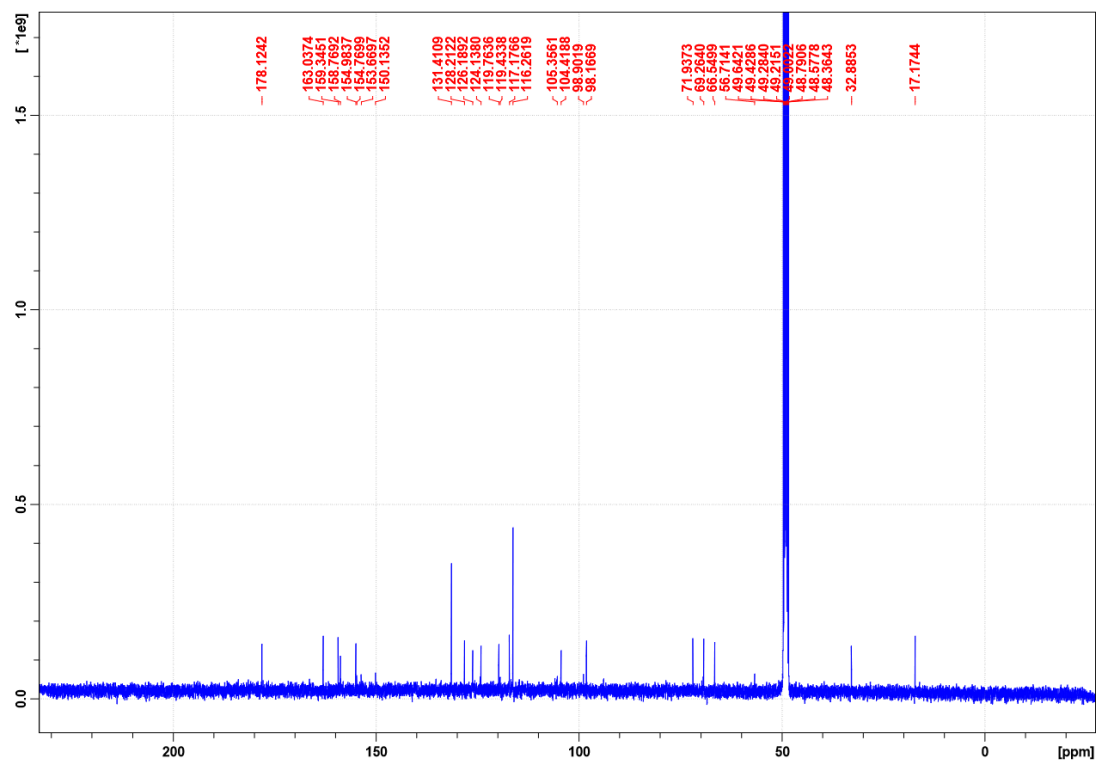


Figure S13. The ^{13}C NMR spectrum of compound 2 in CD_3OD (400 MHz)

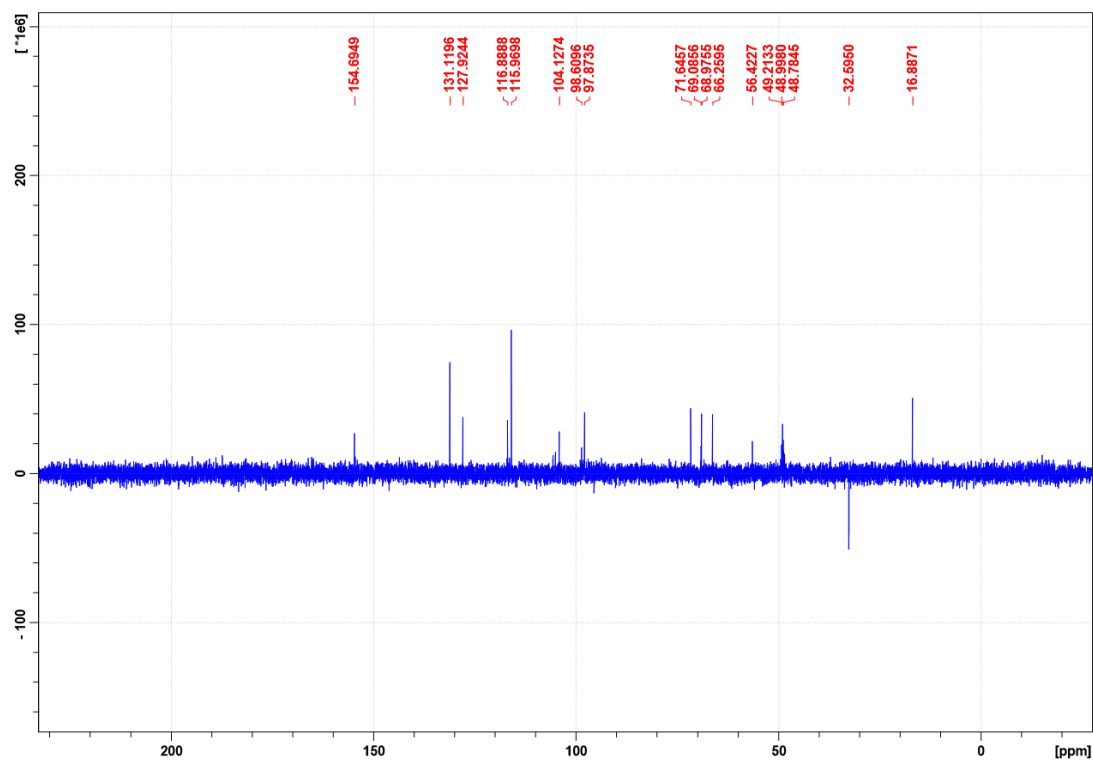


Figure S14. The DEPT spectrum of compound 2 in CD_3OD (400 MHz)

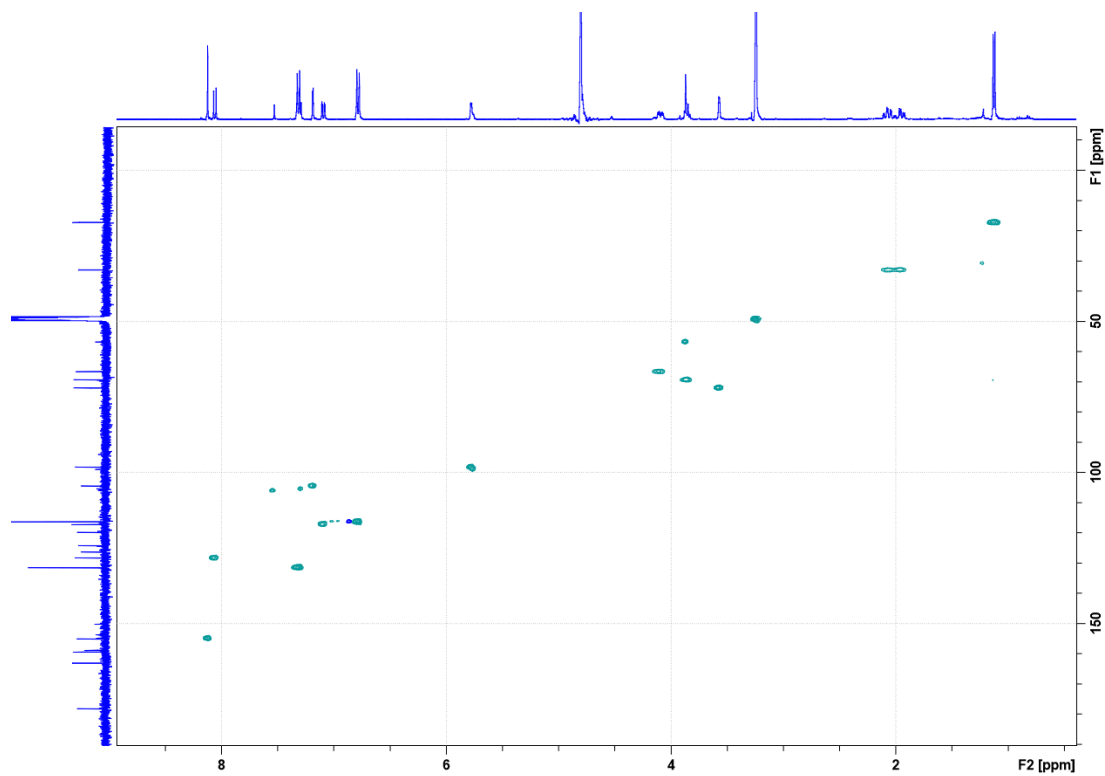


Figure S15. The HSQC spectrum of compound **2** in CD₃OD (400 MHz)

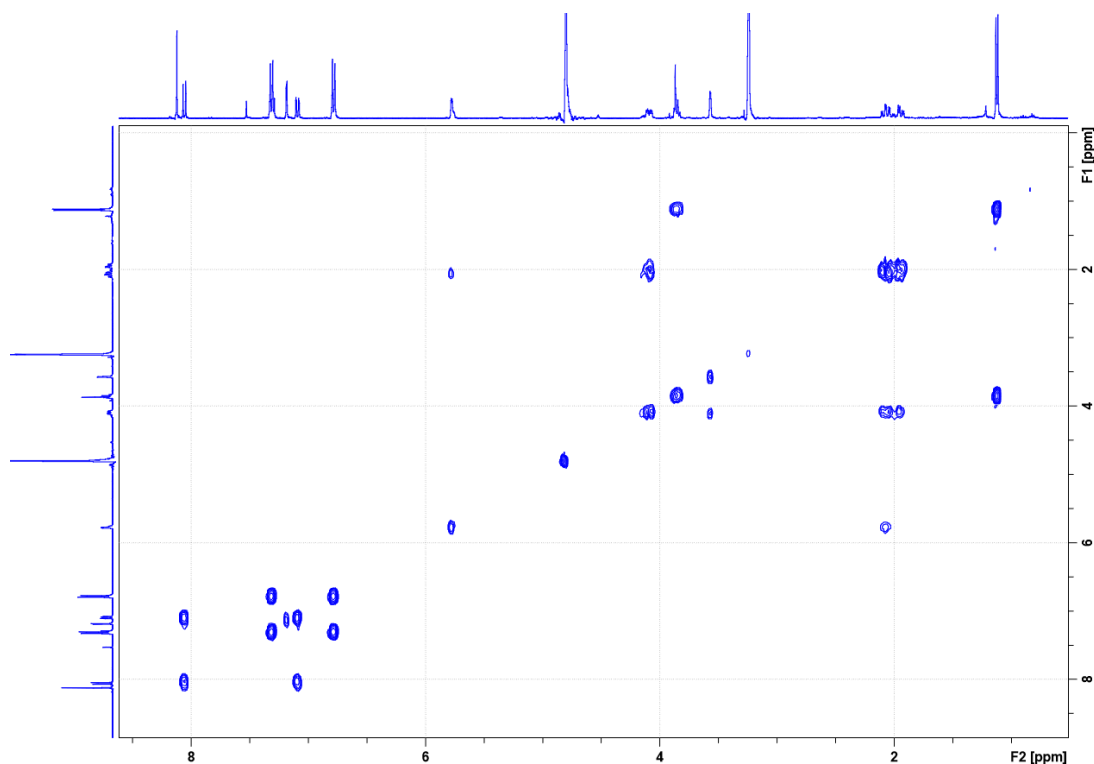


Figure S16. The ¹H-¹H COSY spectrum of compound **2** in CD₃OD (400 MHz)

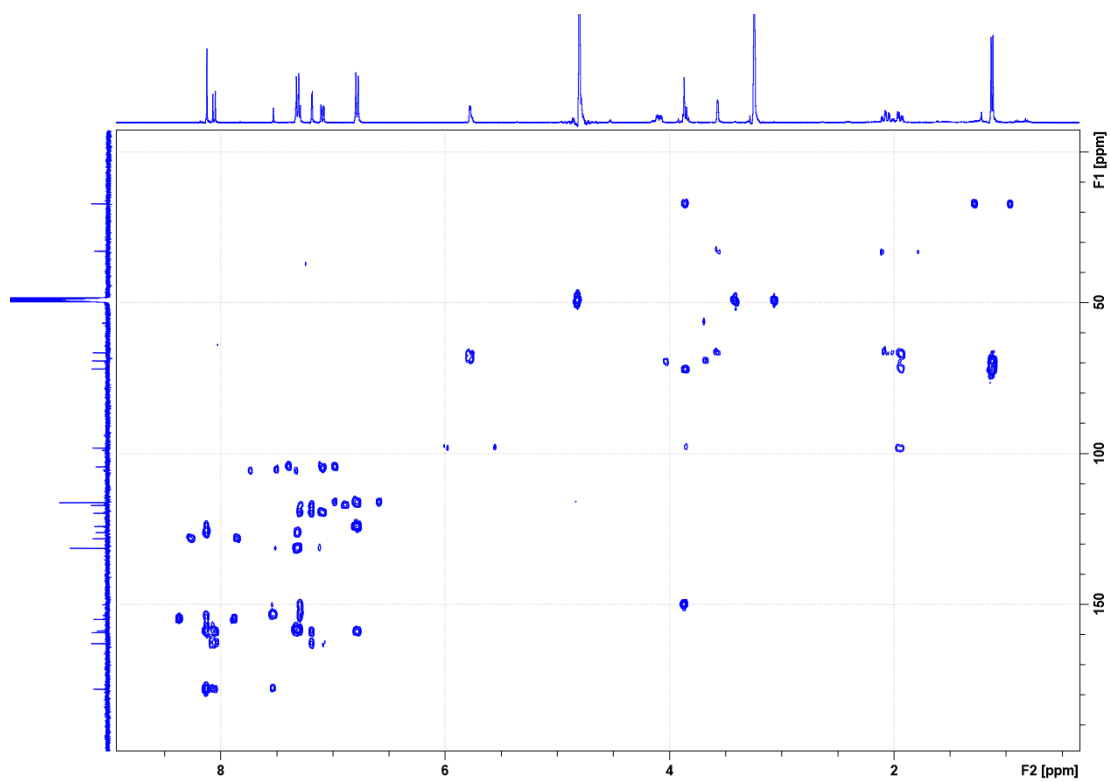


Figure S17. The HMBC spectrum of compound **2** in CD₃OD (400 MHz)

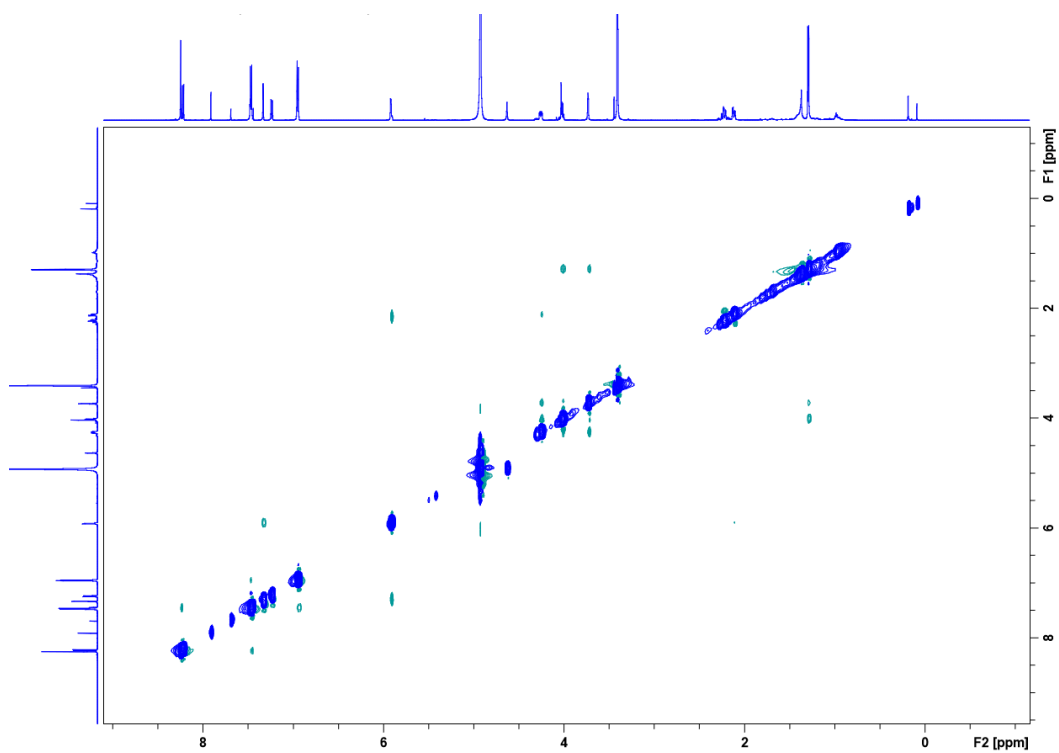


Figure S18. The NOESY spectrum of compound **2** in CD₃OD (600 MHz)

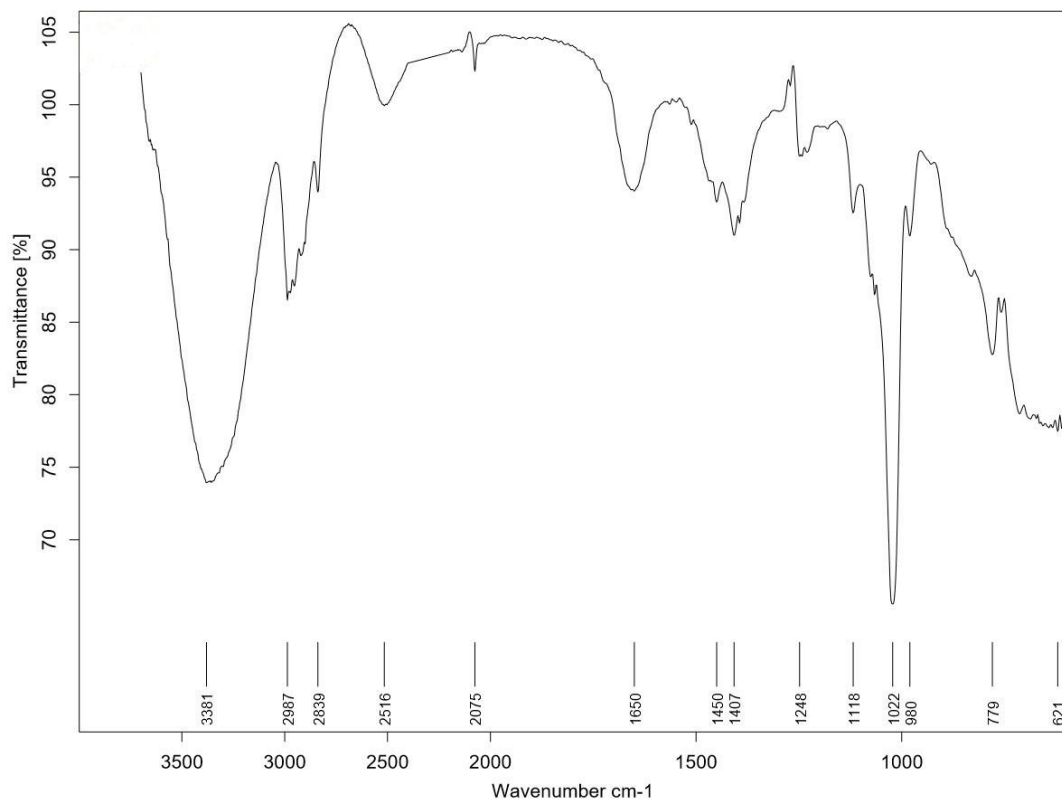


Figure S20. The IR spectrum of compound 3

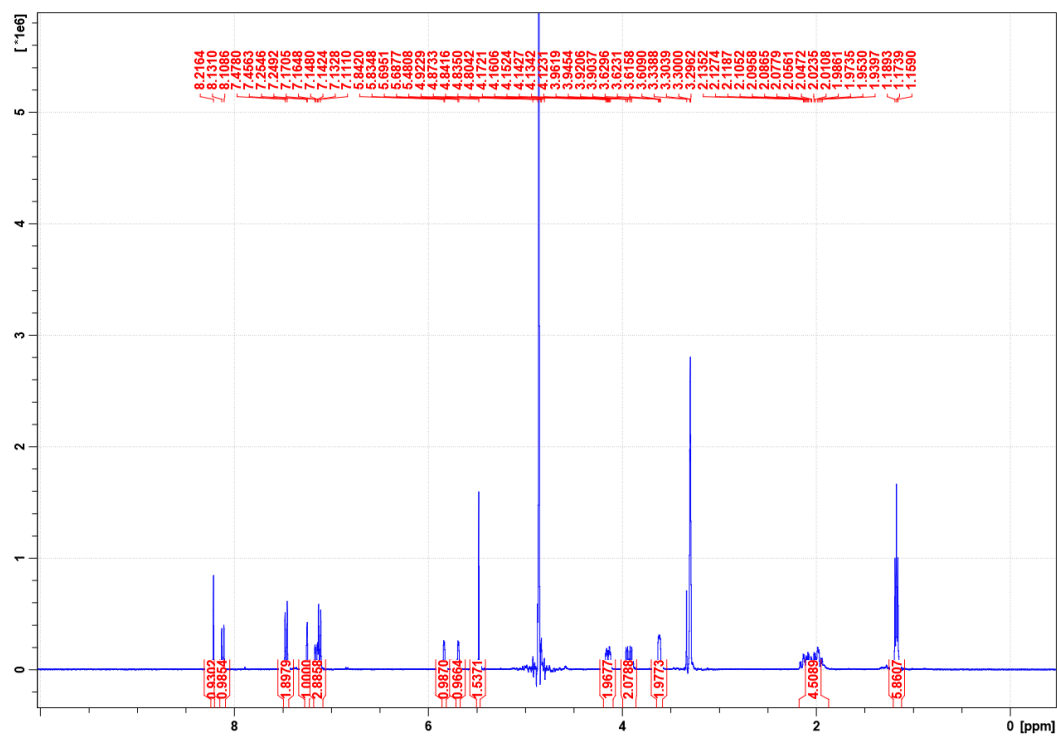


Figure S21. ¹H NMR spectrum of compound 3 in CD₃OD (400 MHz)

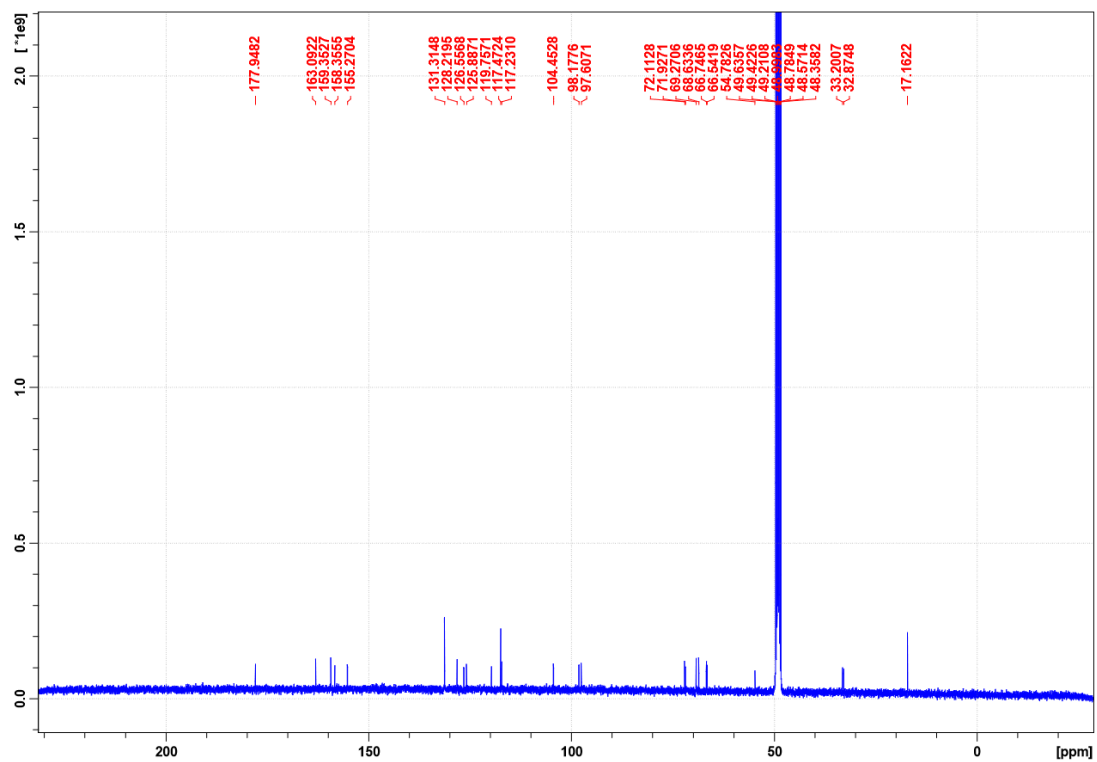


Figure S22. ^{13}C NMR spectrum of compound 3 in CD_3OD (400 MHz)

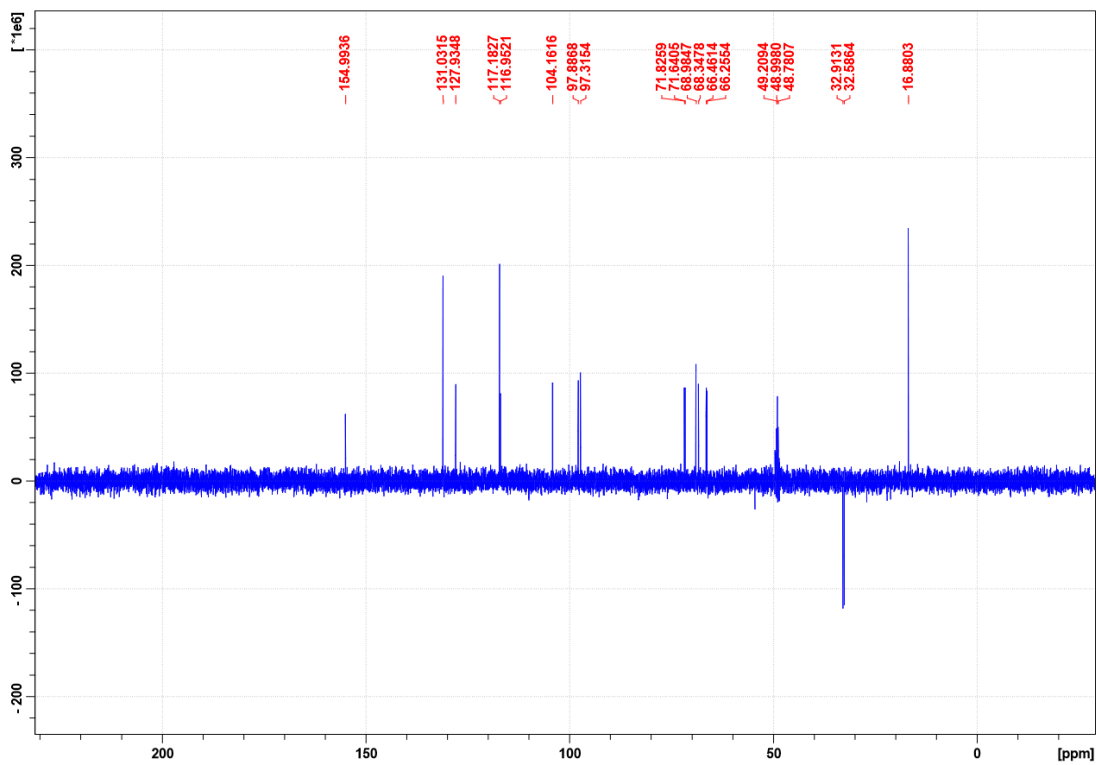


Figure S23. The DEPT spectrum of compound 3 in CD_3OD (400 MHz)

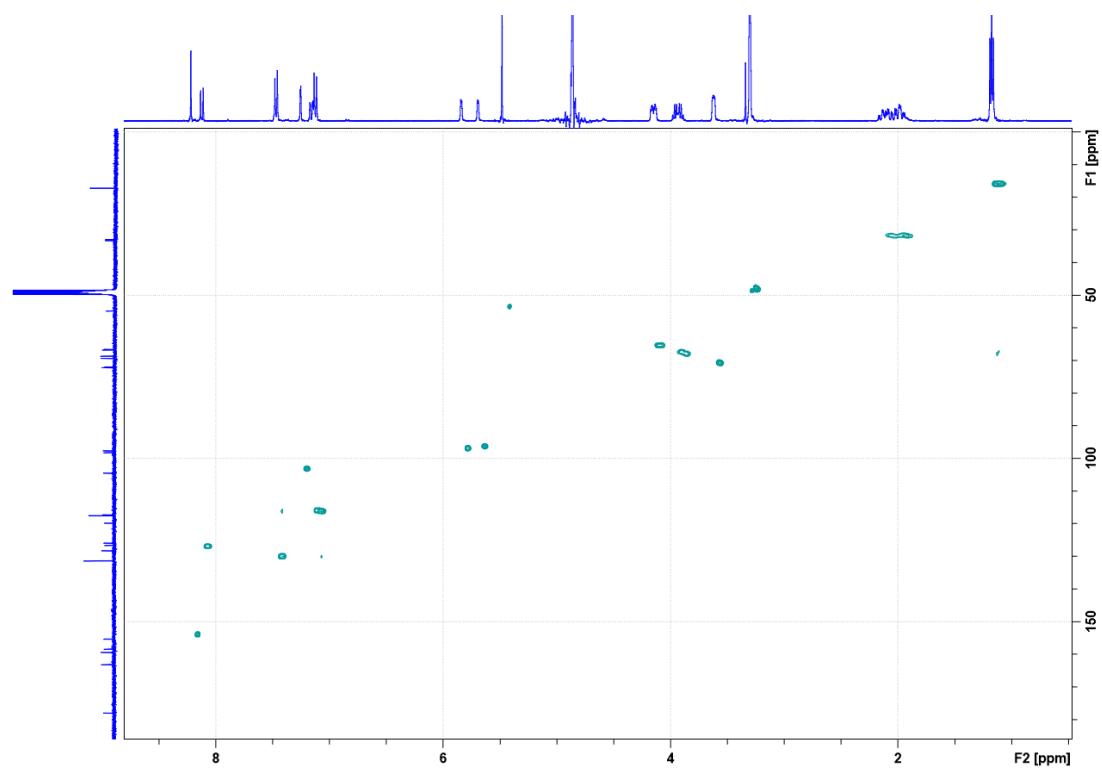


Figure S24. The HSQC spectrum of compound **3** in CD₃OD (400 MHz)

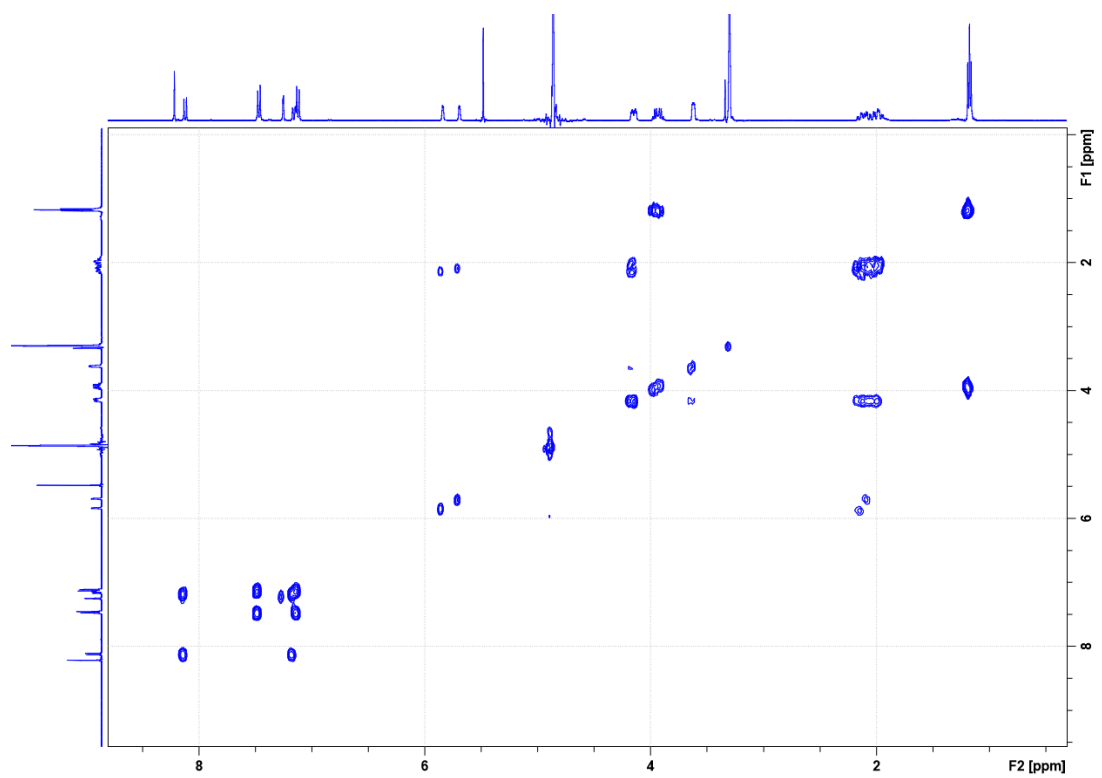


Figure S25. The ¹H-¹H COSY spectrum of compound **3** in CD₃OD (400 MHz)

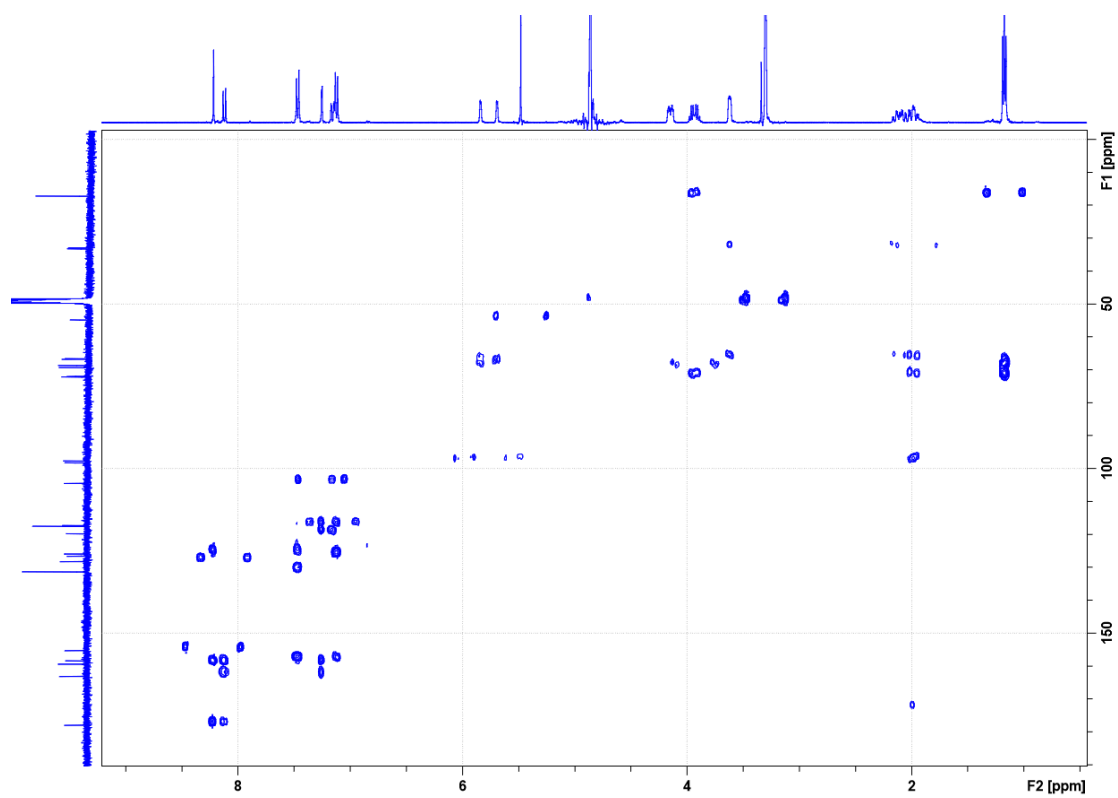


Figure S26. The HMBC spectrum of compound 3 in CD₃OD (400 MHz)

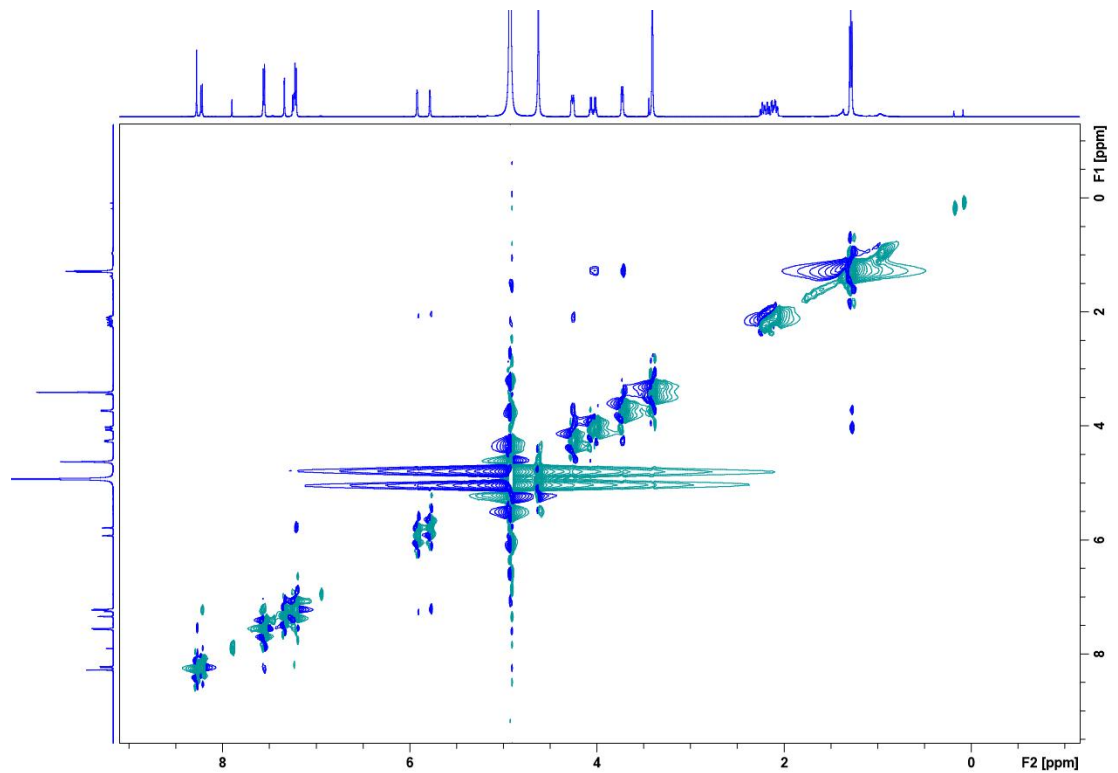


Figure S27. The NOESY spectrum of compound 3 in CD₃OD (600 MHz)

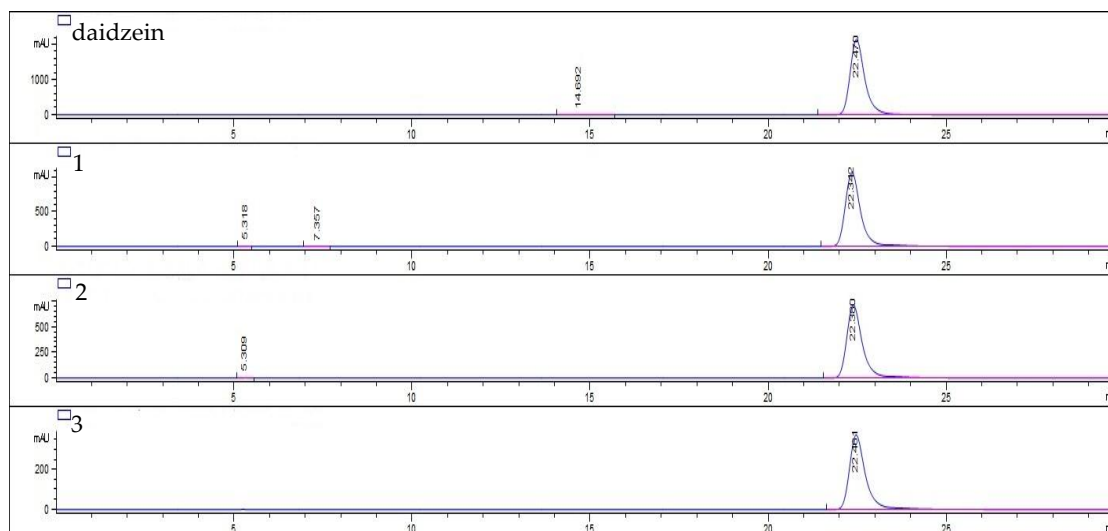


Figure S28. The retention time of daidzein and the aglycone moieties of compounds **1-3**

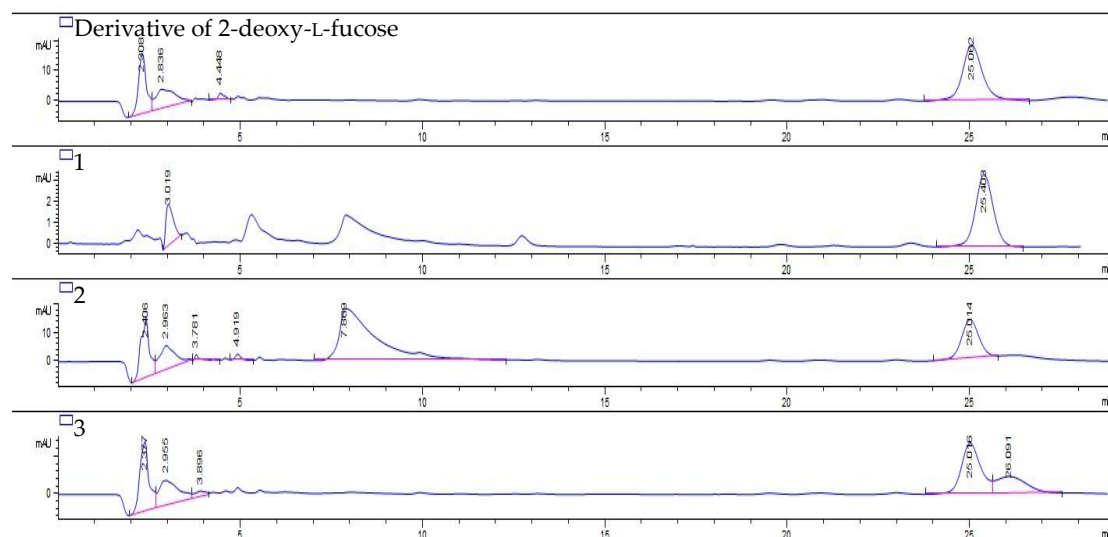


Figure S29. The retention time of the *O*-tolylthiocarbamate derivatives of 2-deoxy-L-fucose and the liberated sugars of compounds **1-3**