

Tsavoenones A–C: Unprecedented Polyketides with a 1,7-dioxadispiro[4.0.4.4]tetradecane core from the Lichen *Parmotrema tsavoense*

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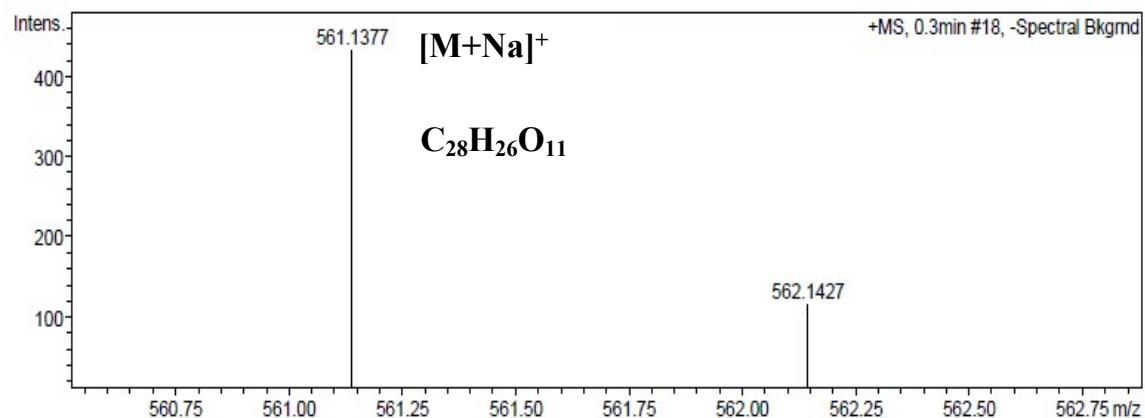
Dr. Pierre Le Pogam, Équipe « Pharmacognosie-Chimie des Substances Naturelles », BioCIS, Univ. Paris-Sud,
CNRS, University Paris-Saclay, 5 Rue J.-B. Clément, 92290 Châtenay-Malabry, France

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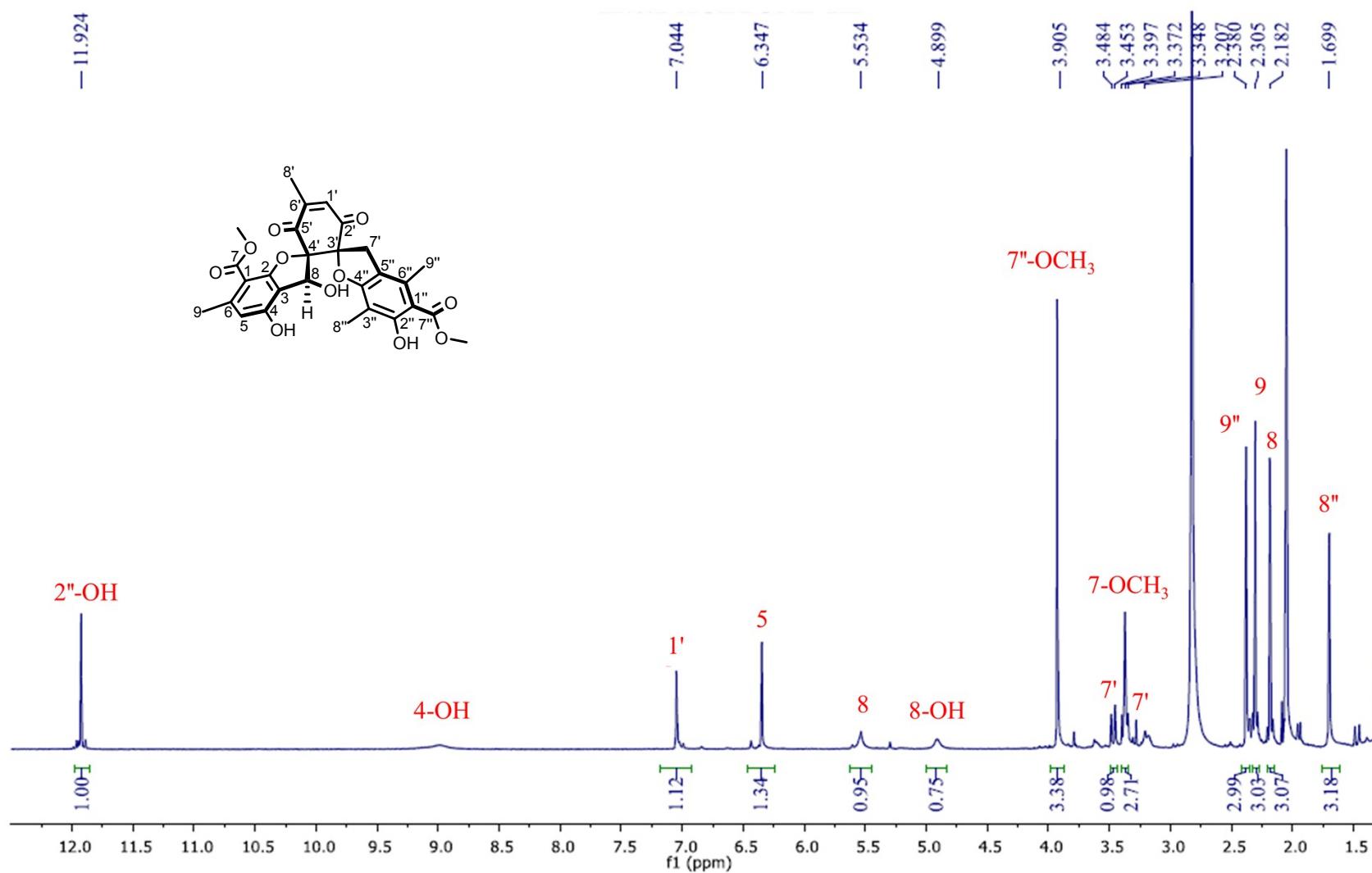
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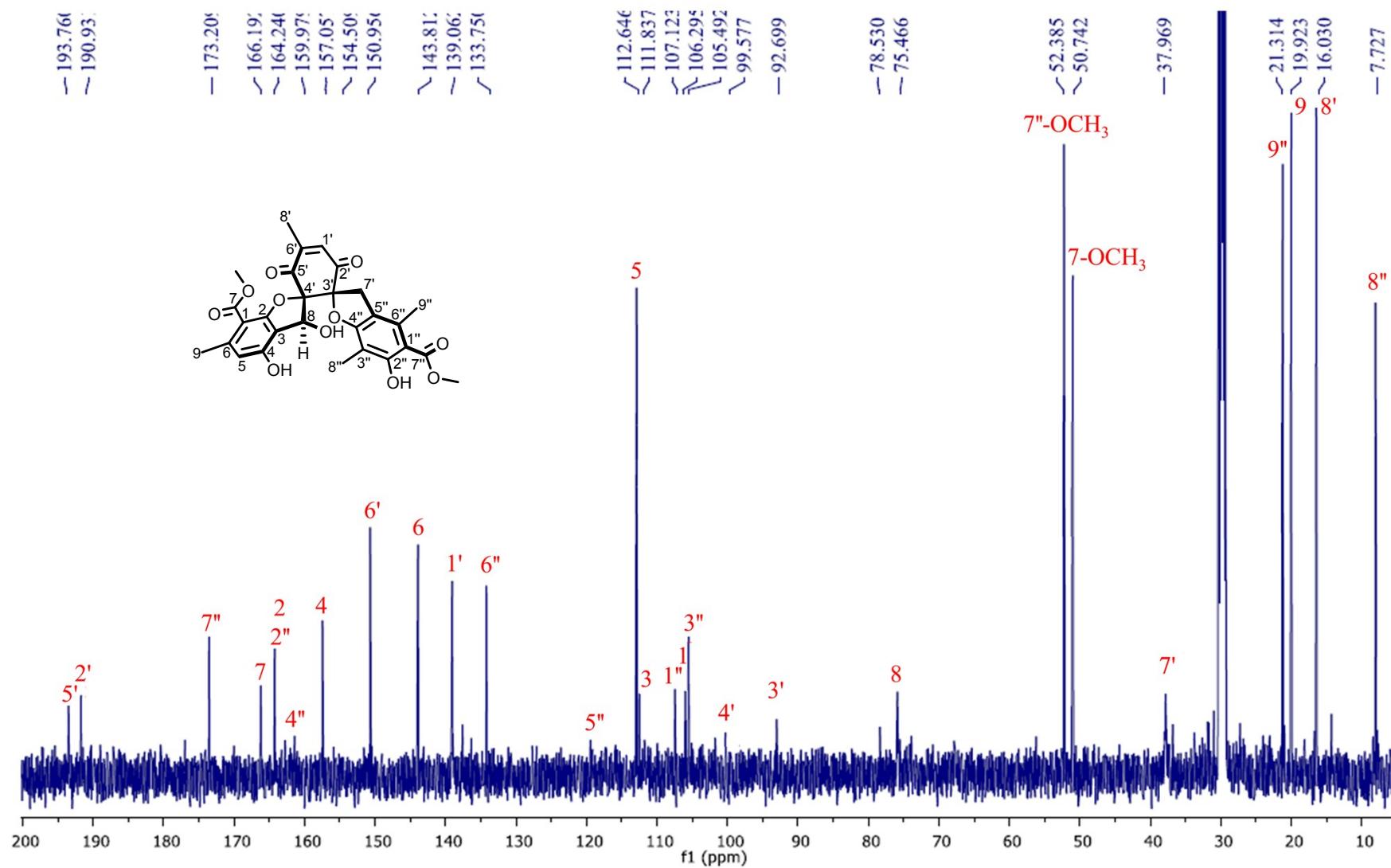
S1. HRESIMS spectrum of **1**



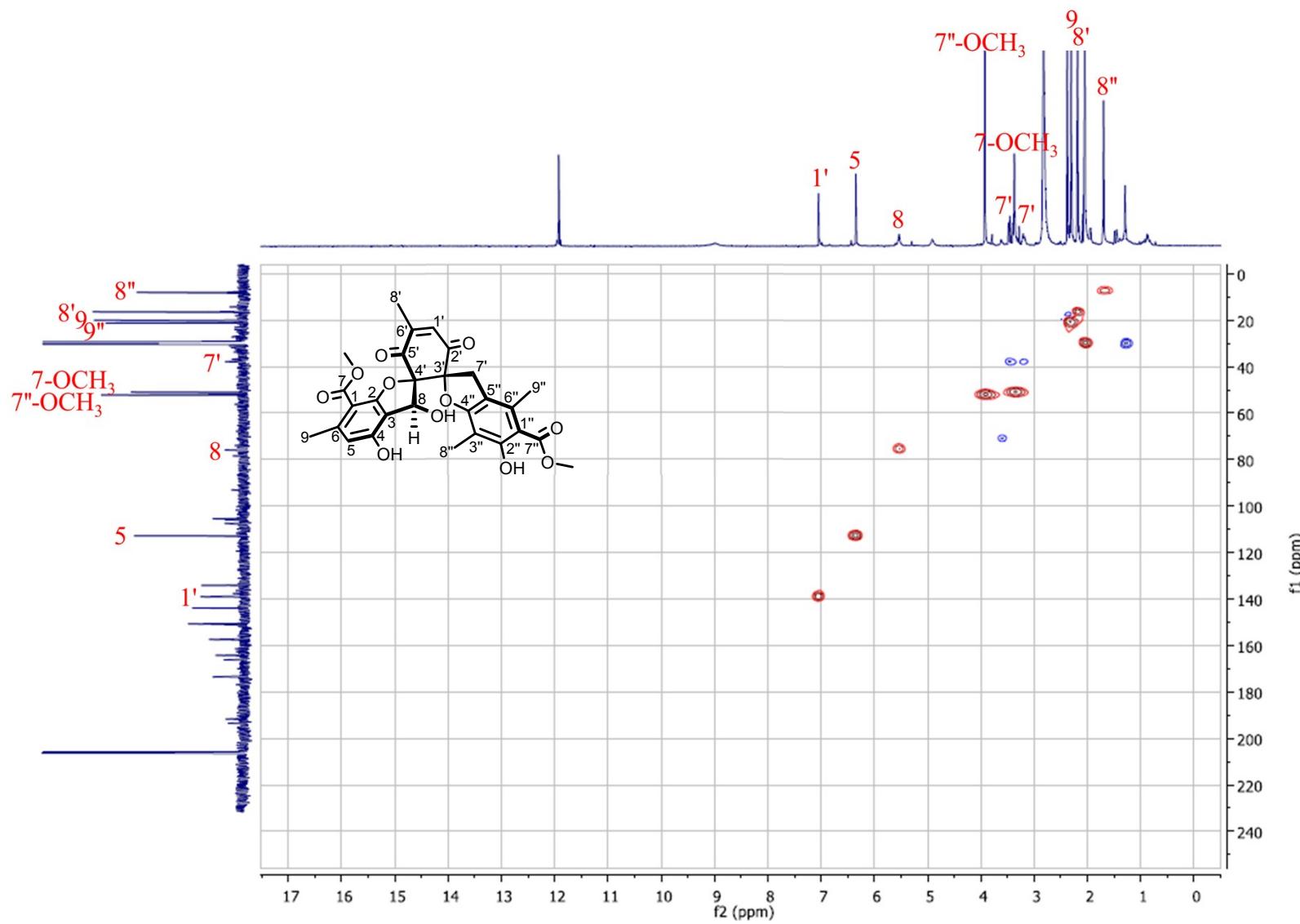
S2. ^1H NMR (acetone- d_6 , 500 MHz) spectrum of **1**



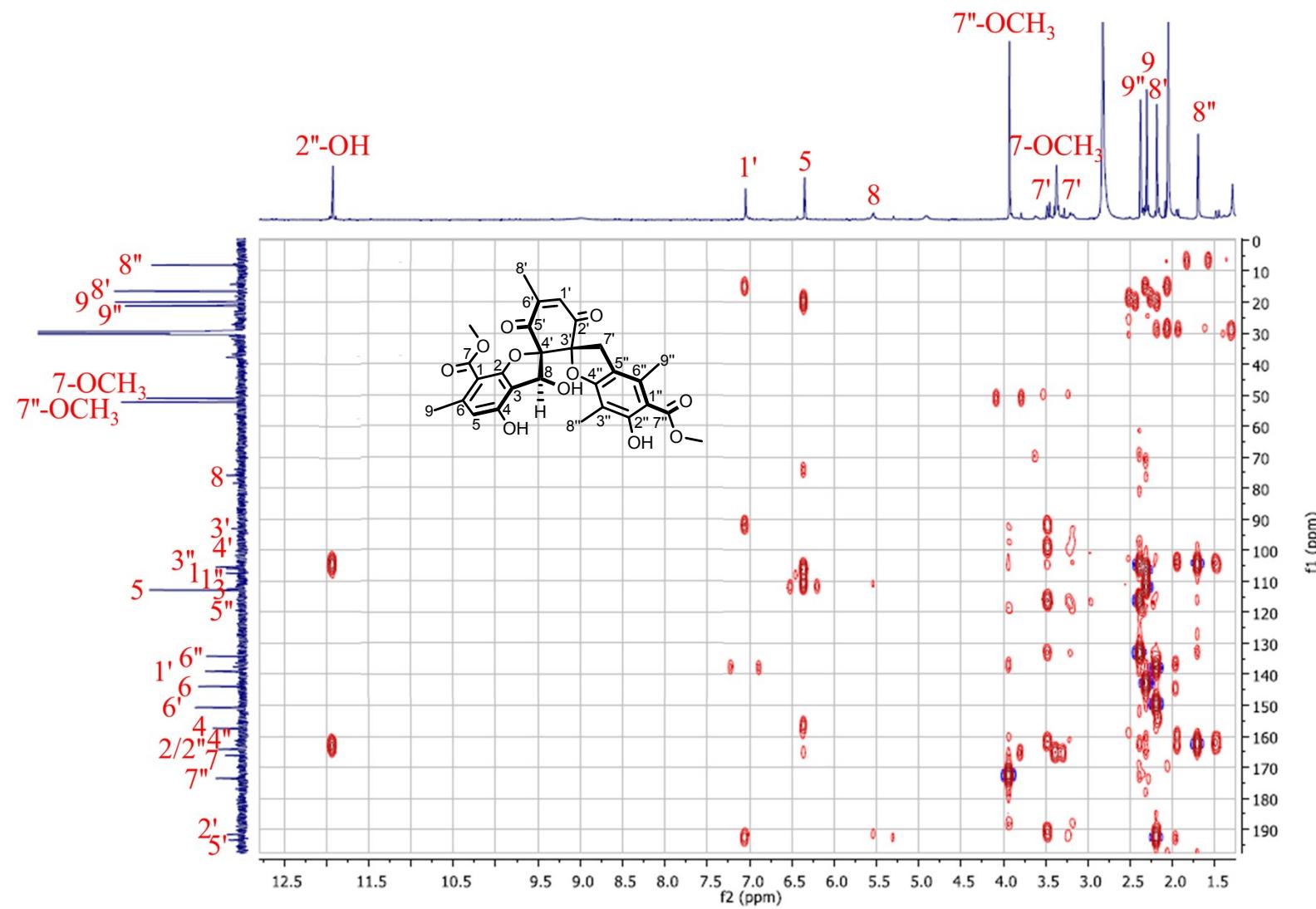
S3. ^{13}C NMR (acetone- d_6 , 500 MHz) spectrum of **1**



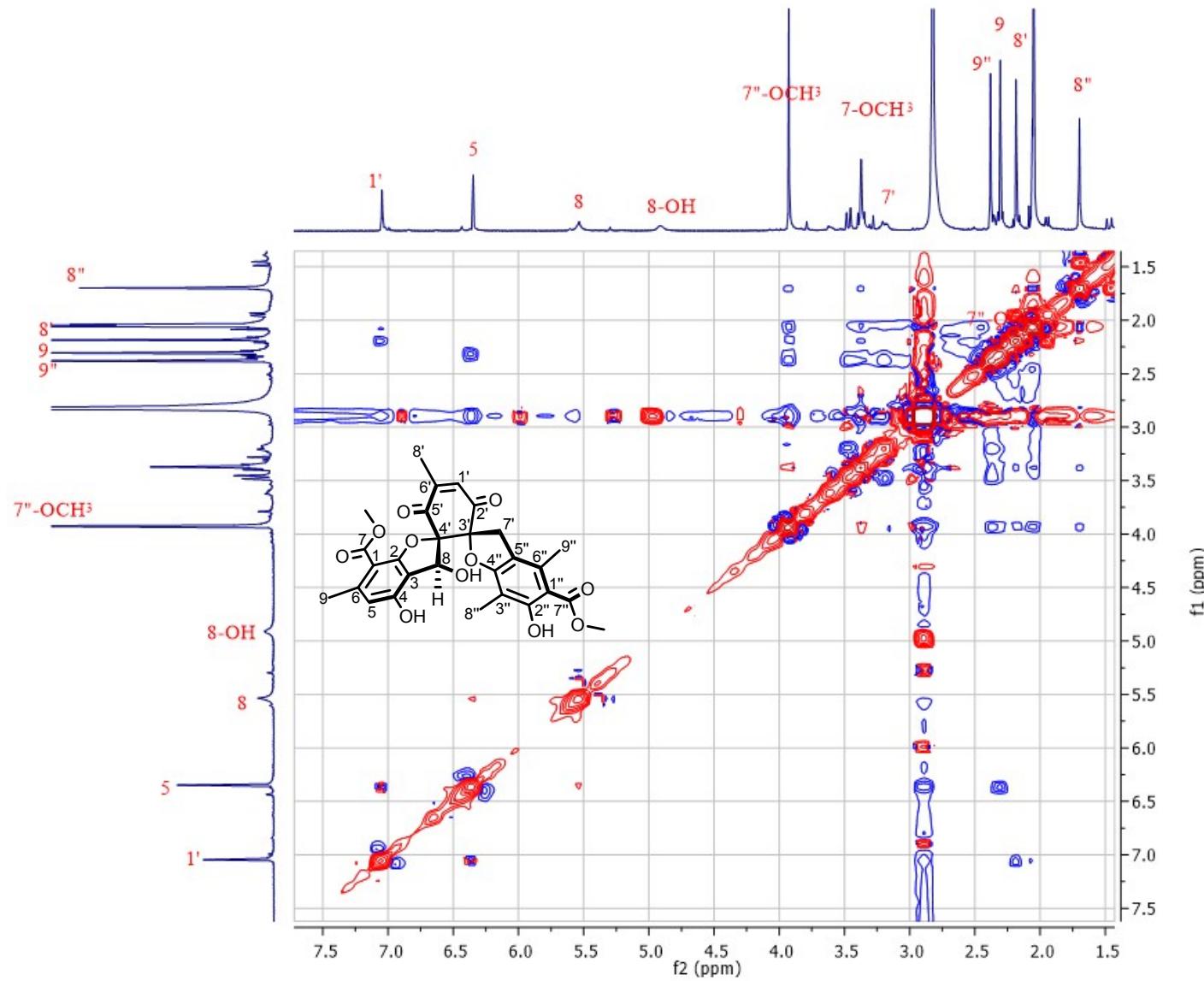
S4. HSQC (acetone- d_6 , 500 MHz, 125 MHz) spectrum of **1**



S5. HMBC (acetone-*d*₆, 500 MHz, 125 MHz) spectrum of **1**



S6. NOESY (acetone-*d*₆, 500 MHz) spectrum of 1.

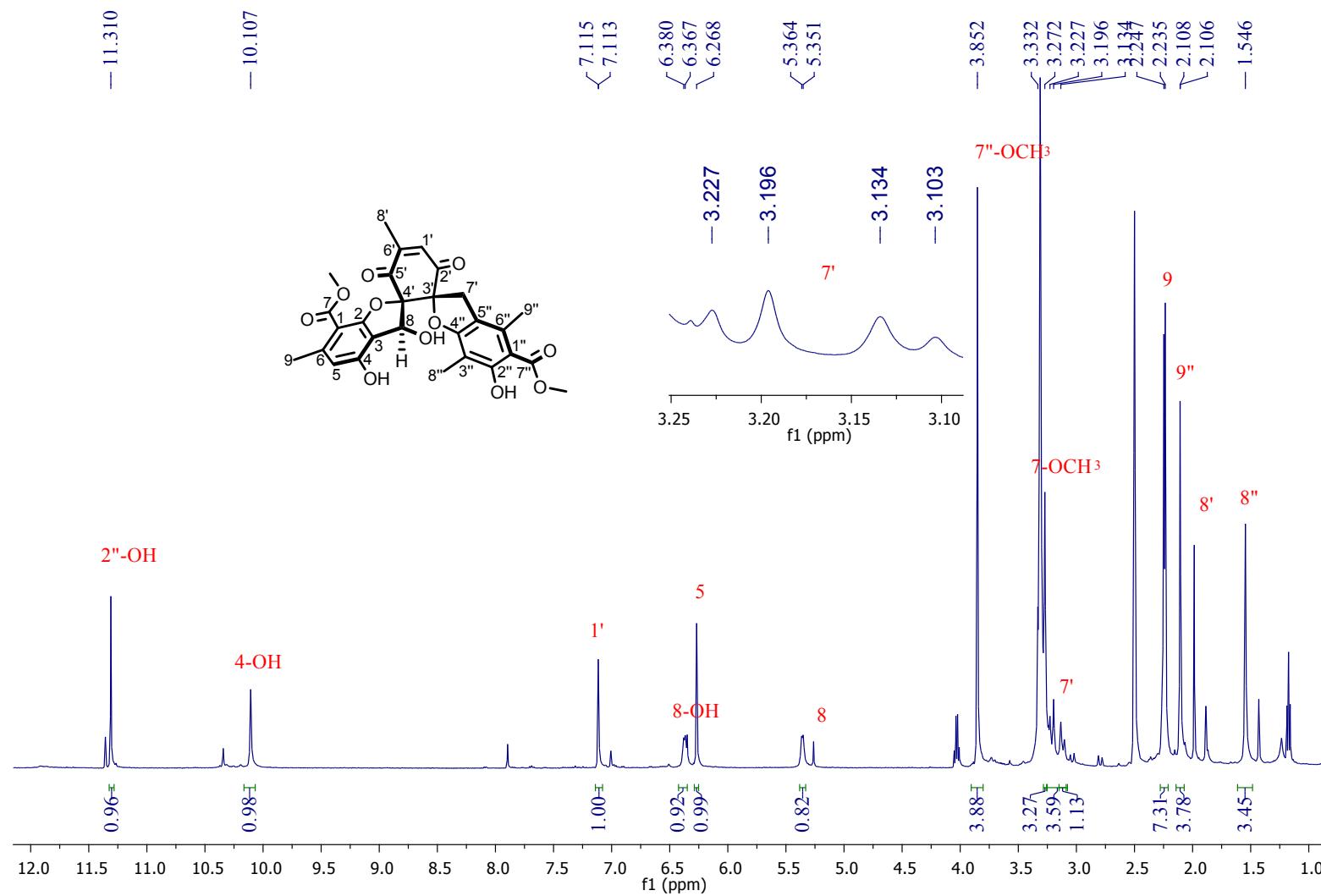


S7. ^1H and ^{13}C NMR (DMSO- d_6) Spectroscopic Data For Tsavoenones A (**1**)

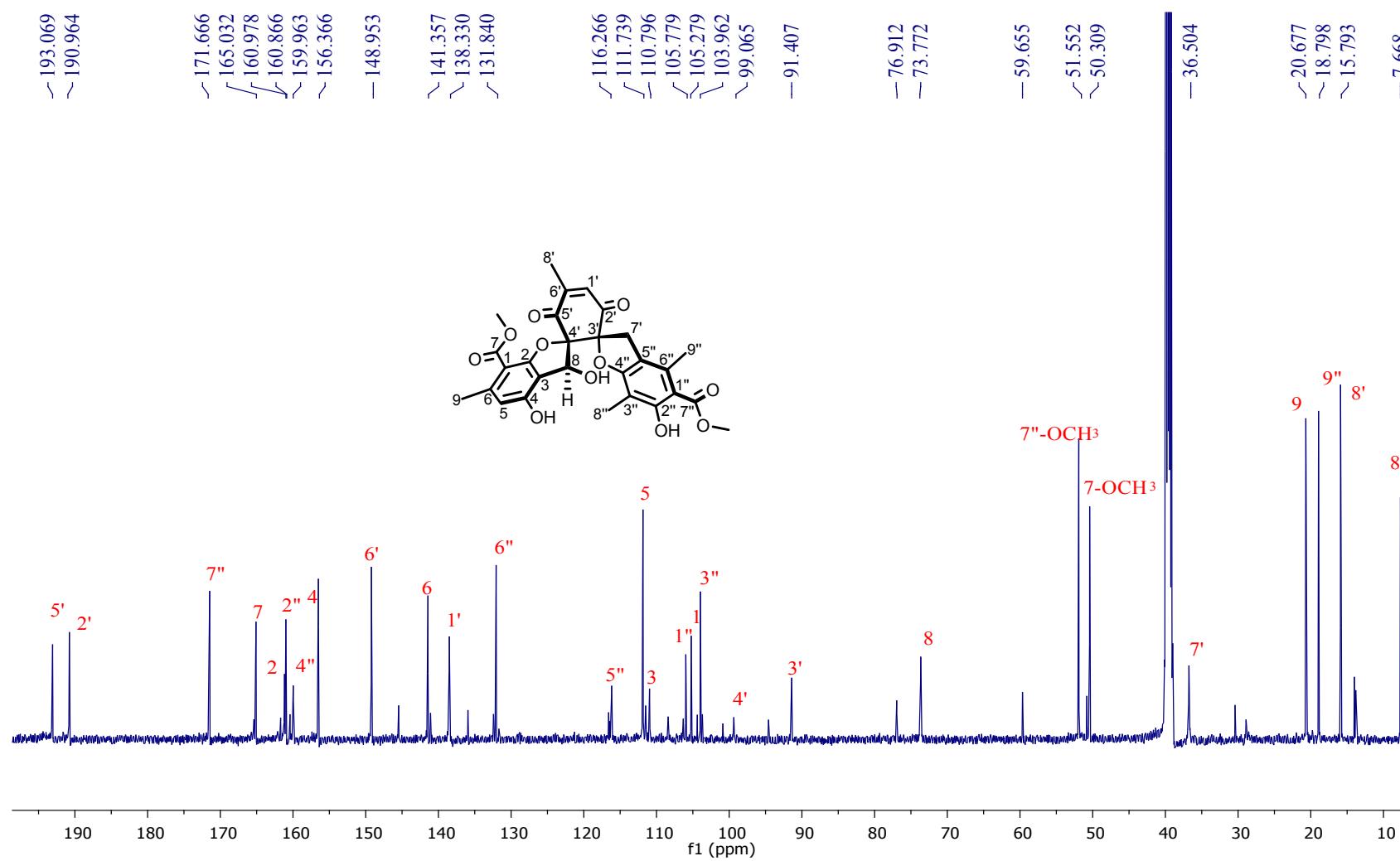
1		
position	δ_{H} , mult (J , Hz)	δ_{c}
1		105.3
2		160.9
3		110.8
4		156.4
5	6.27, s	111.7
6		141.4
7		165.0
8	5.35, d (6.5)	73.8
9	2.24, s	20.7
7-OCH ₃	3.27, s	50.3
1'	7.11, d (1.0)	138.3
2'		191.0
3'		91.4
4'		99.1
5'		193.1
6'		149.0
7'	3.20, d (15.5) 3.11, d (15.5)	36.5
8'	2.11, d (1.0)	15.8
1"		105.8
2"		161.0
3"		104.0
4"		160.0
5"		116.3
6"		131.8
7"		171.7
8"	1.55, s	7.7
9"	2.25, s	18.8
7"-OCH ₃	3.85, s	51.6
4-OH	10.11, s	
8-OH	6.38, d (6.5)	
2"-OH	11.31, s	

Regarding spectra obtained in DMSO- d_6 , unlabeled (1D NMR) and strikethrough signals (2D NMR) refer to peaks that appeared upon long storage of **1**, thus not belonging to the native molecule. This can be ascertained by comparison to the spectra recorded in acetone- d_6 .

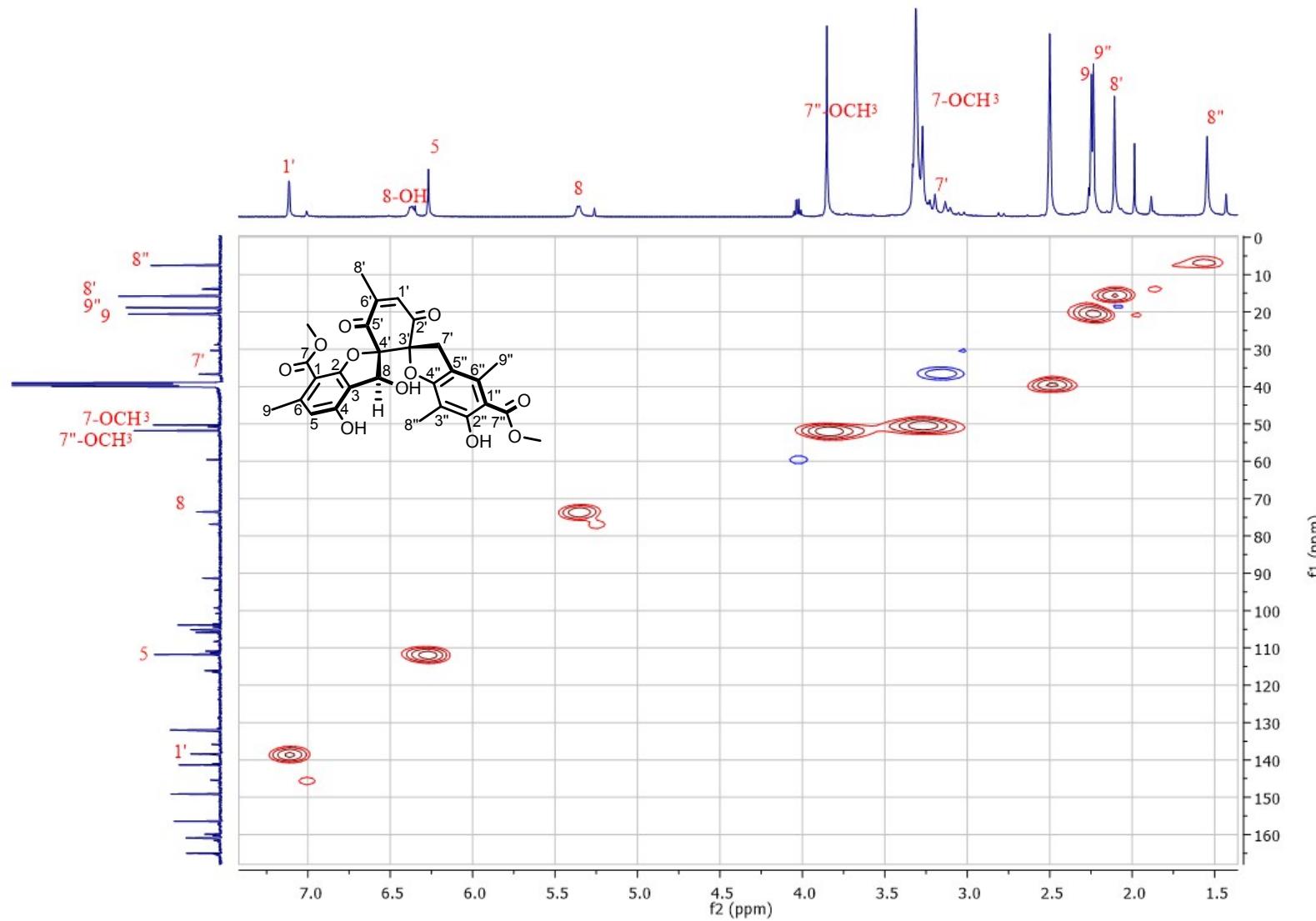
S8. ^1H NMR (DMSO- d_6 , 500 MHz) spectrum of **1**



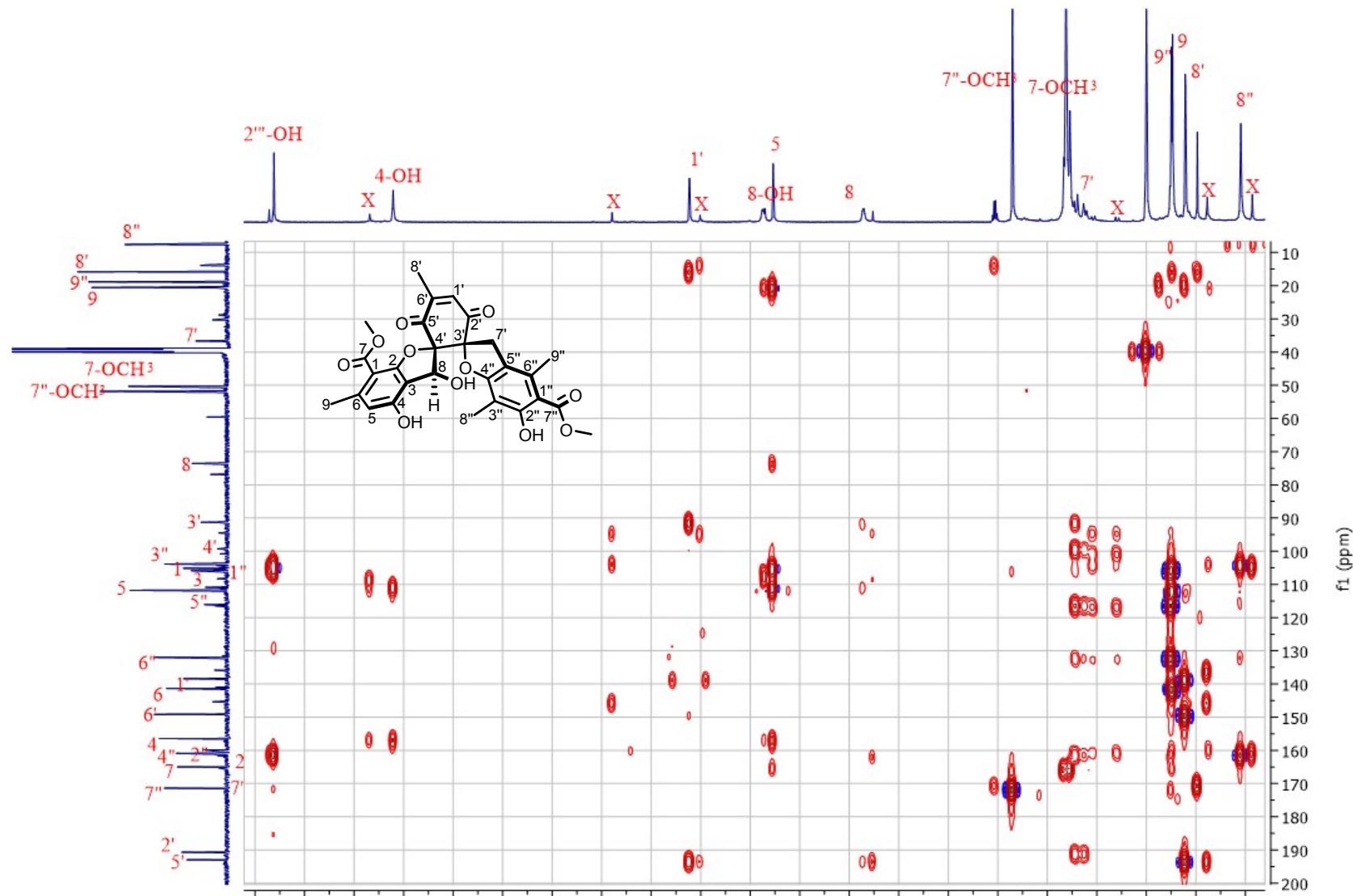
S9. ^{13}C NMR (DMSO- d_6 , 125 MHz) spectrum of **1**



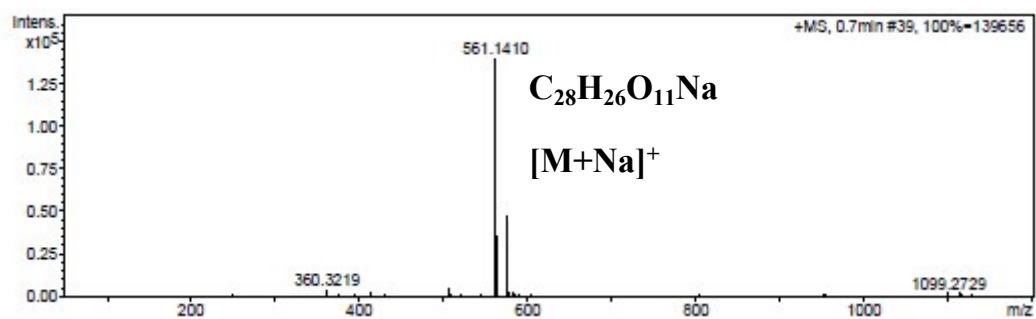
S10. HSQC (DMSO-*d*₆, 500 MHz, 125 MHz) spectrum of **1**



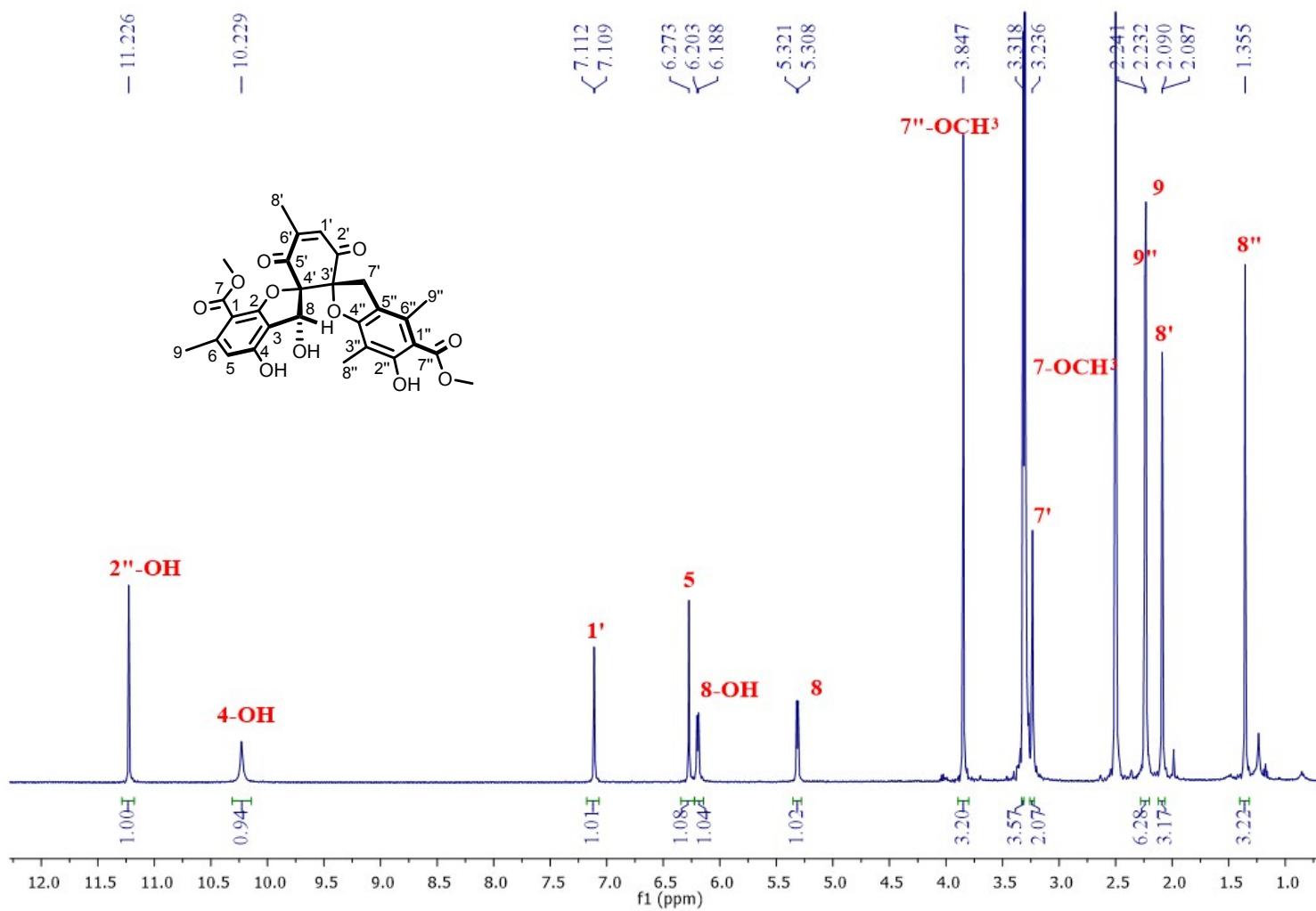
S11. HMBC (DMSO-*d*₆, 500 MHz, 125 MHz) spectrum of **1**



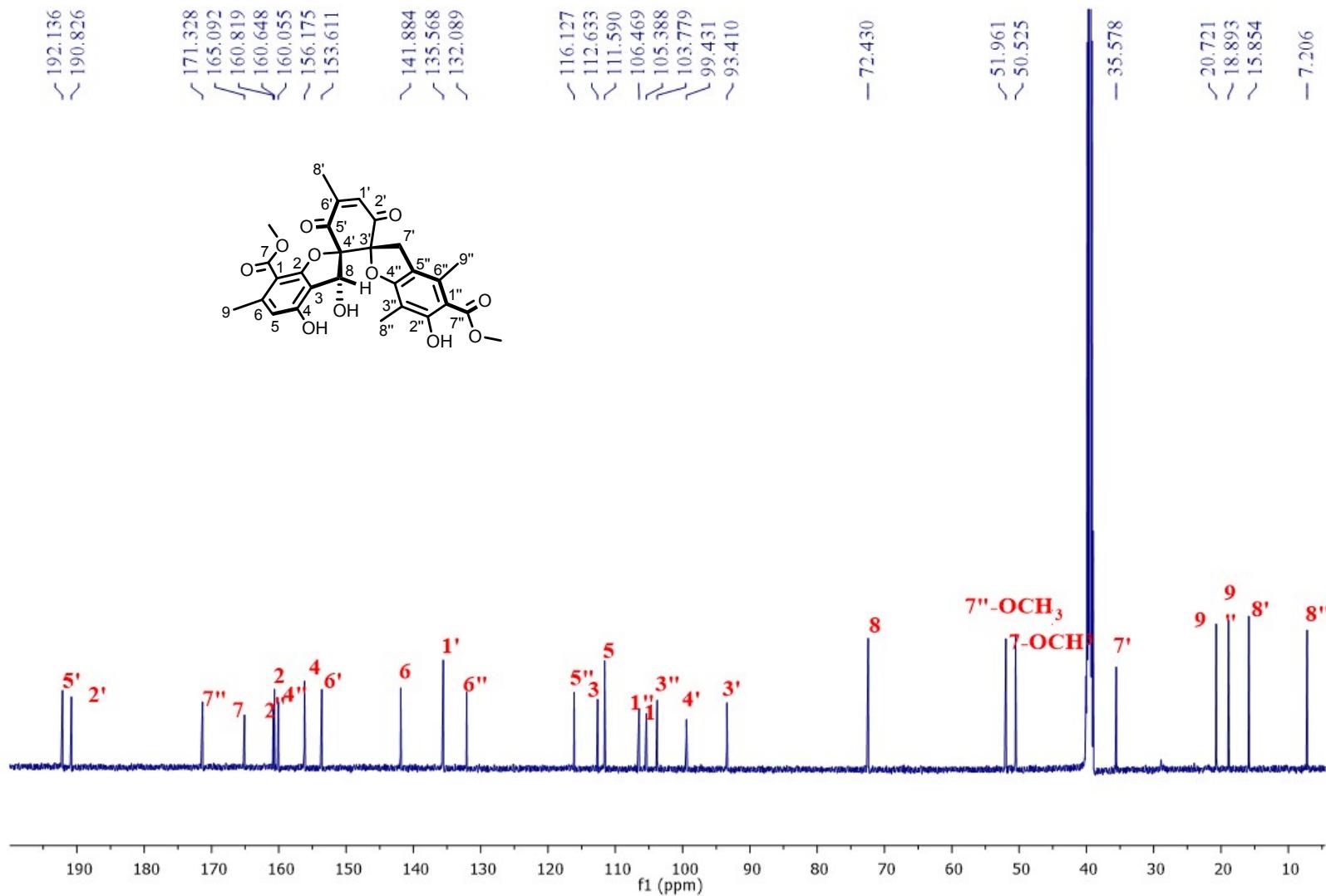
S12. HRESIMS spectrum of 2.



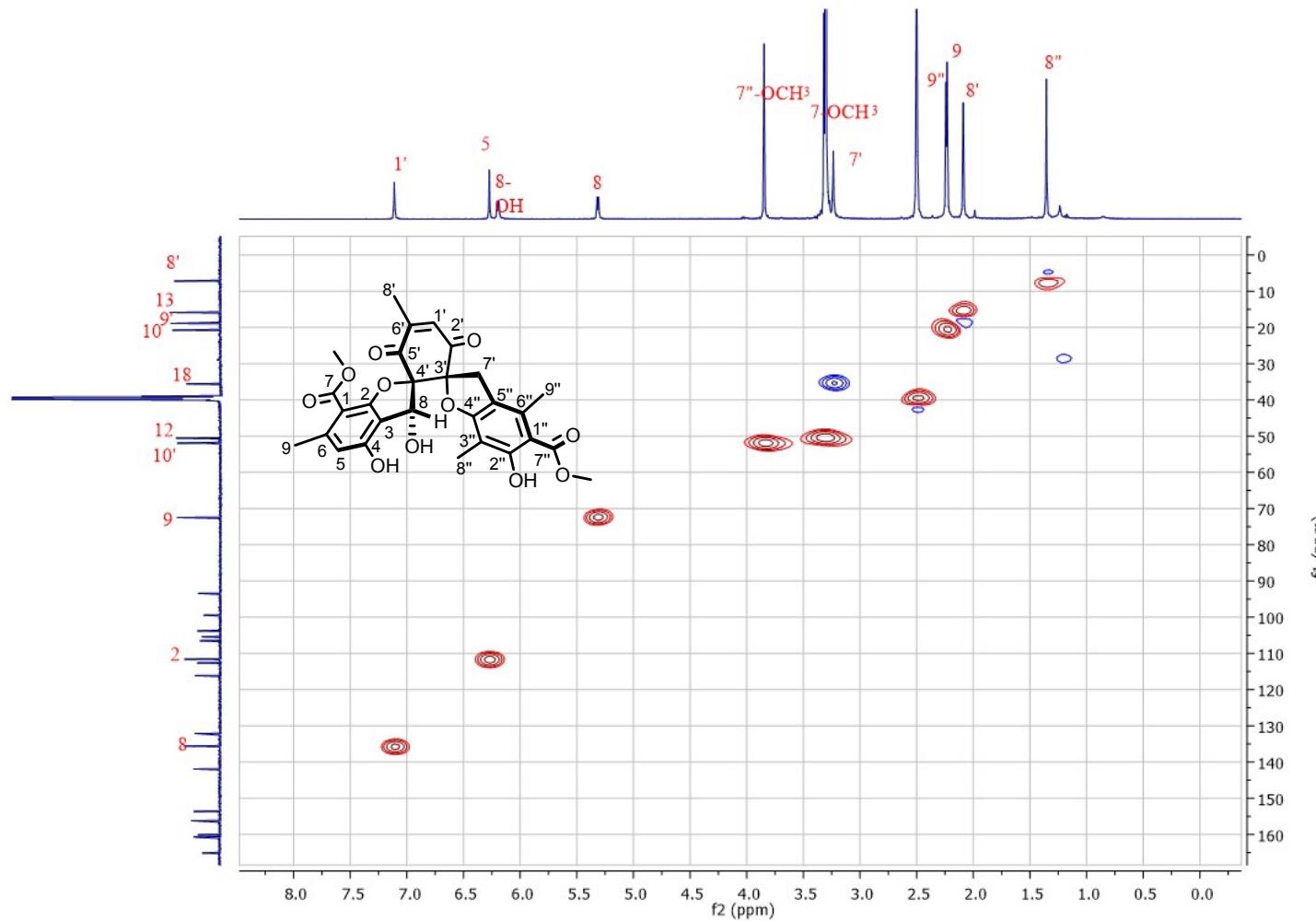
S13. ^1H NMR (DMSO- d_6 , 500 MHz) spectrum of 2



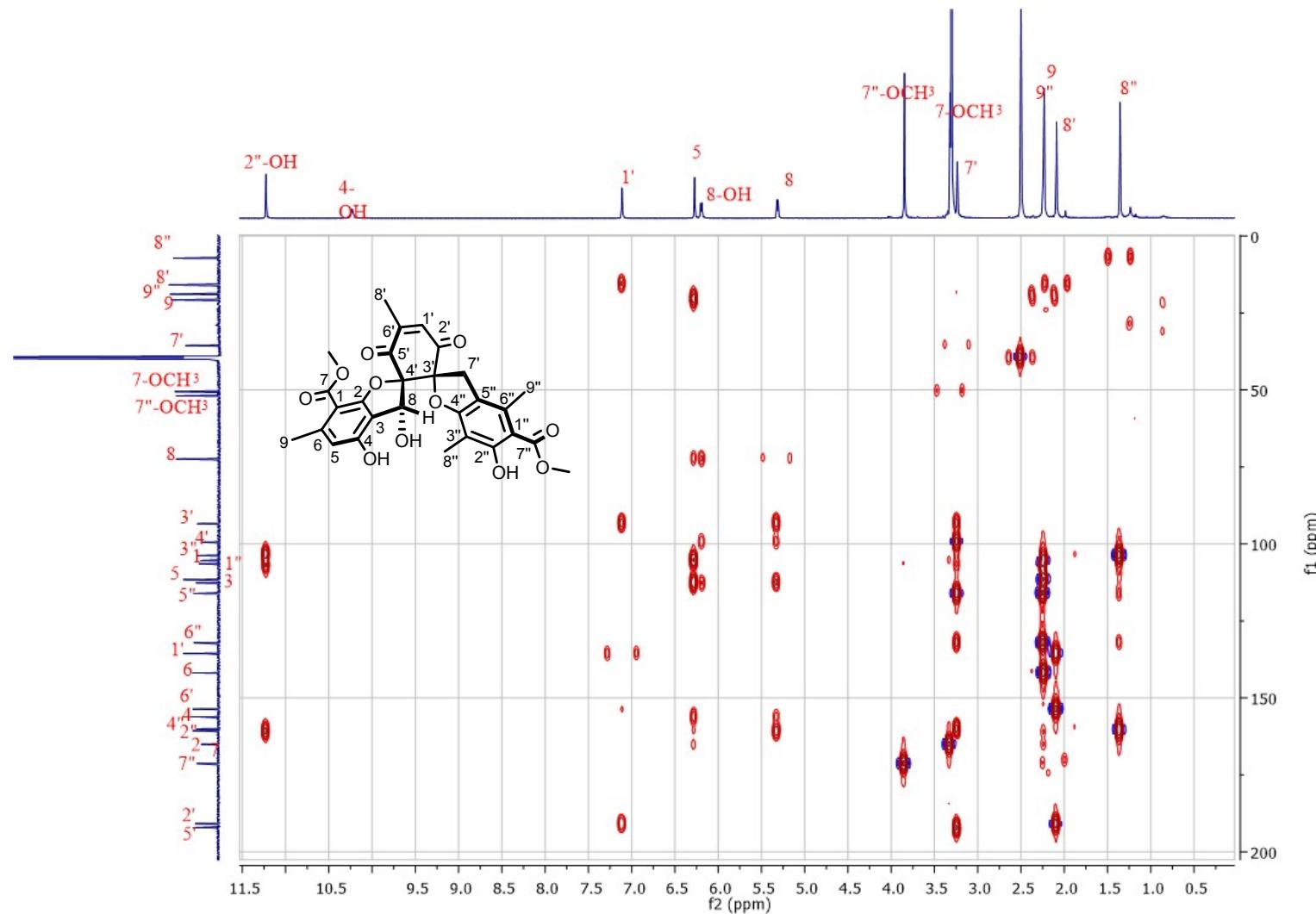
S14. ^{13}C NMR (DMSO- d_6 , 125 MHz) spectrum of **2**



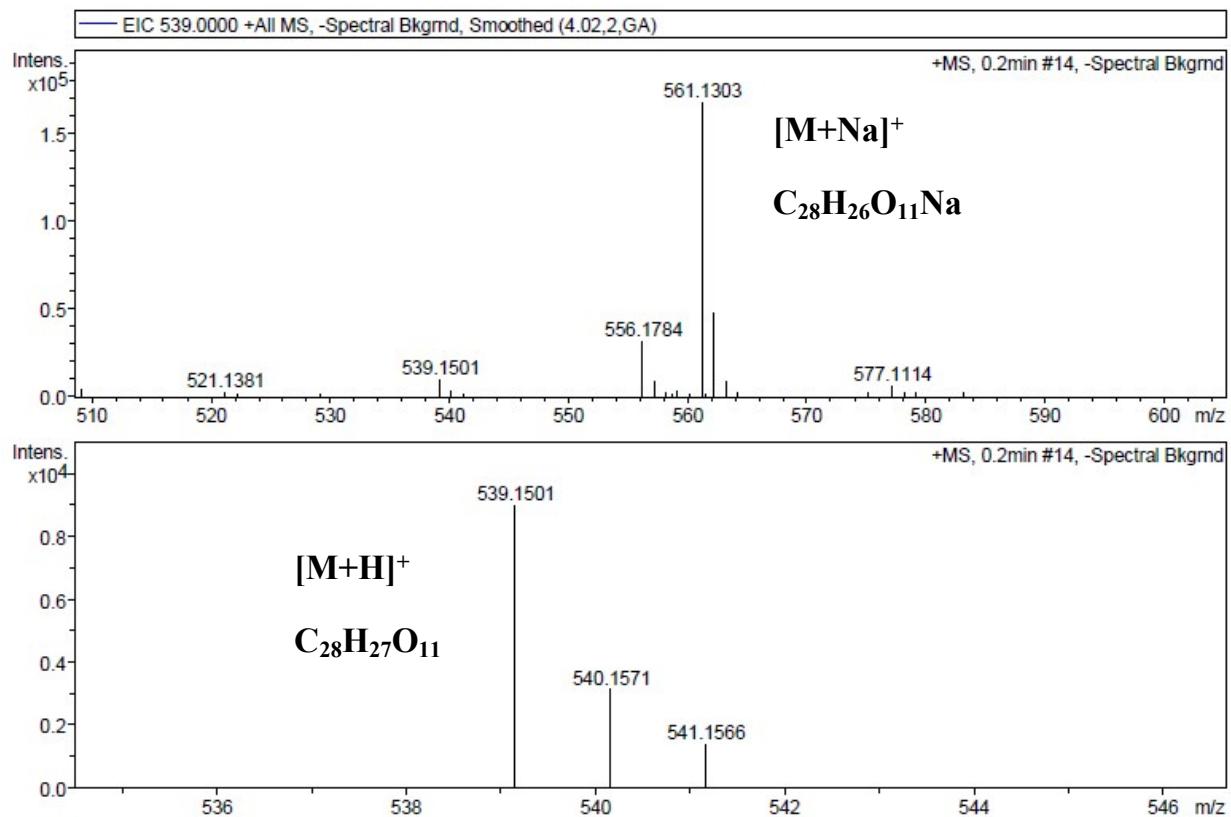
S15. HSQC (DMSO-*d*₆, 500 MHz, 125 MHz) spectrum of **2**



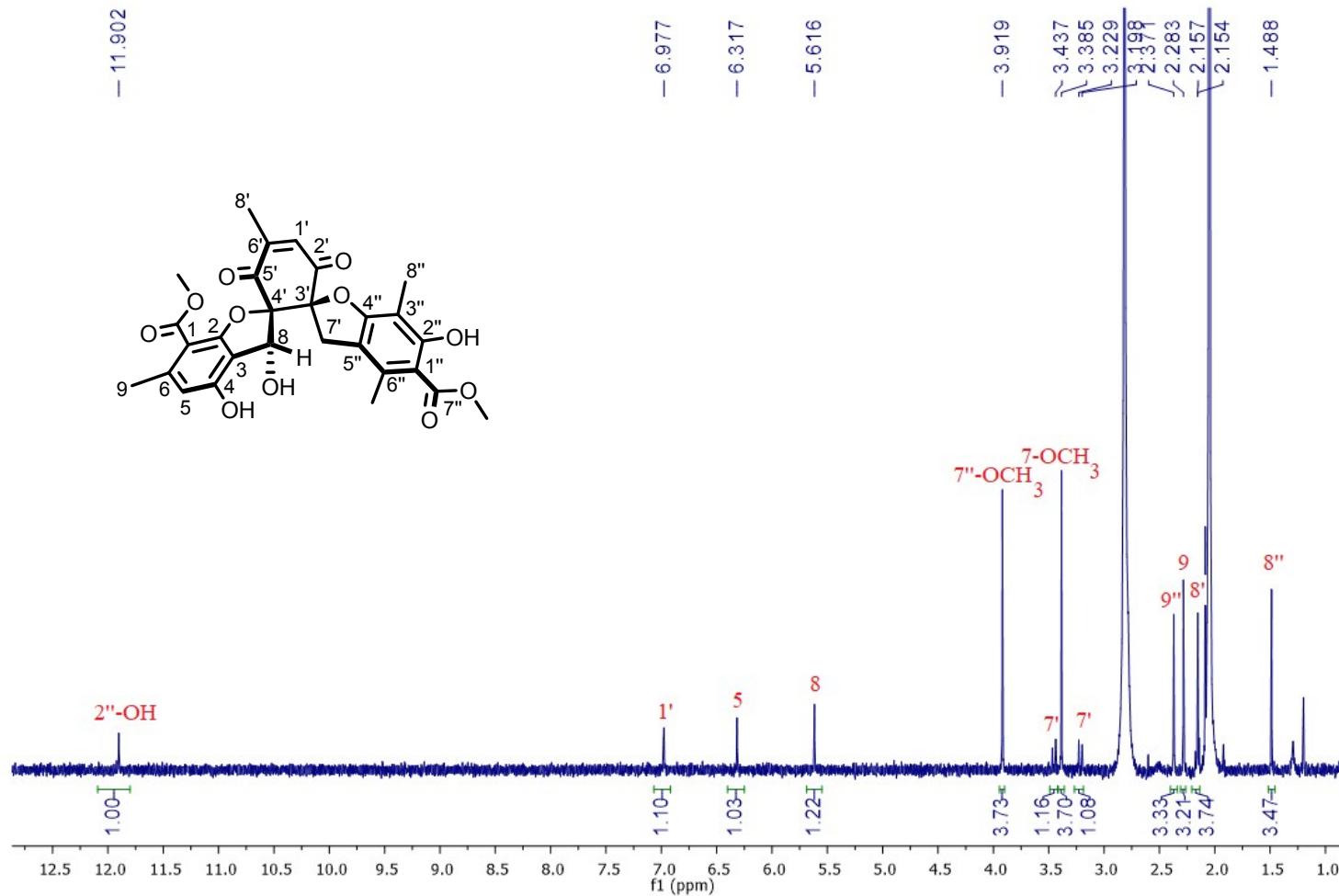
S16. HMBC (DMSO-*d*₆, 500 MHz, 125 MHz) spectrum of **2**



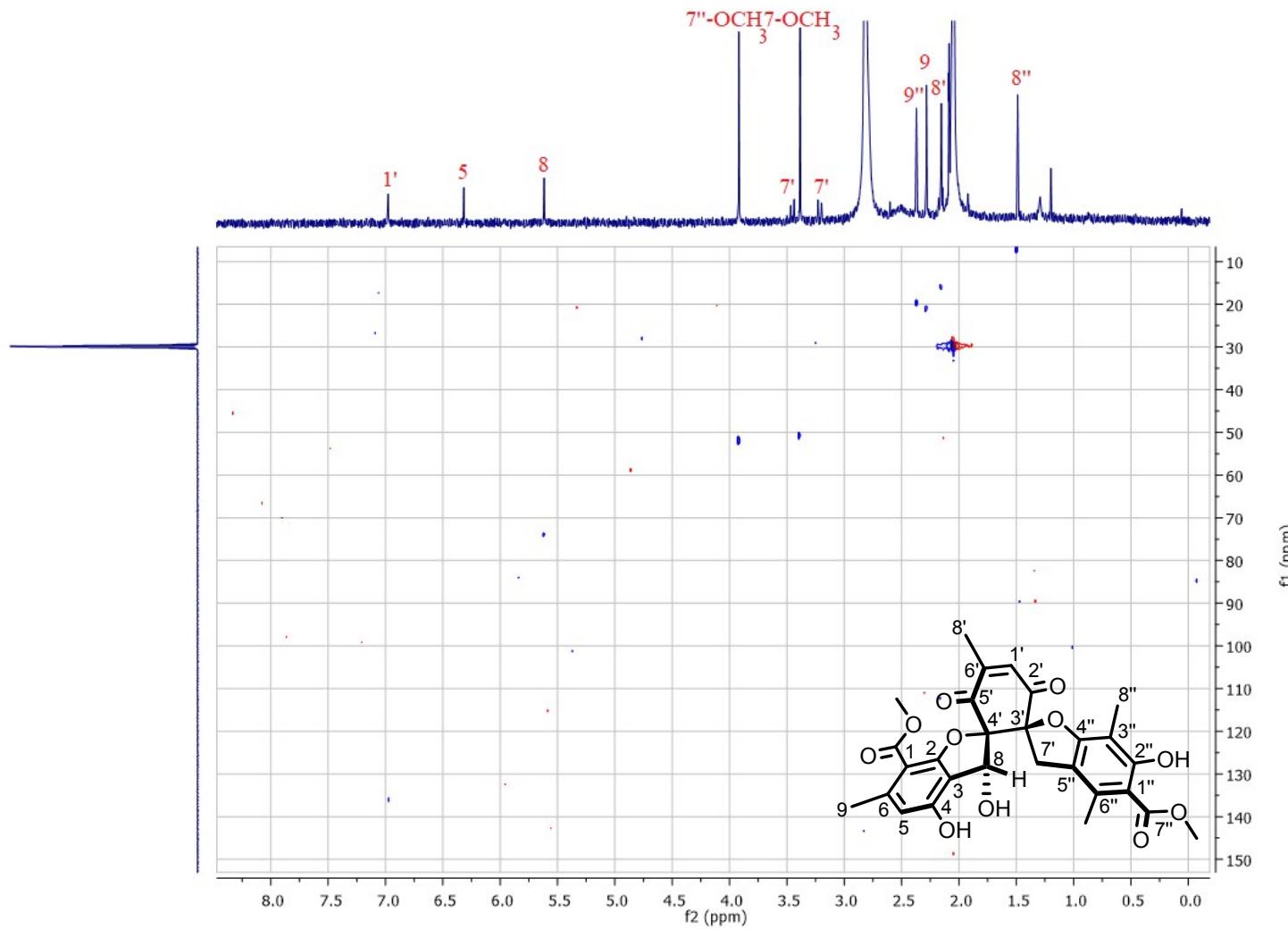
S17. HRESIMS spectrum of 3.



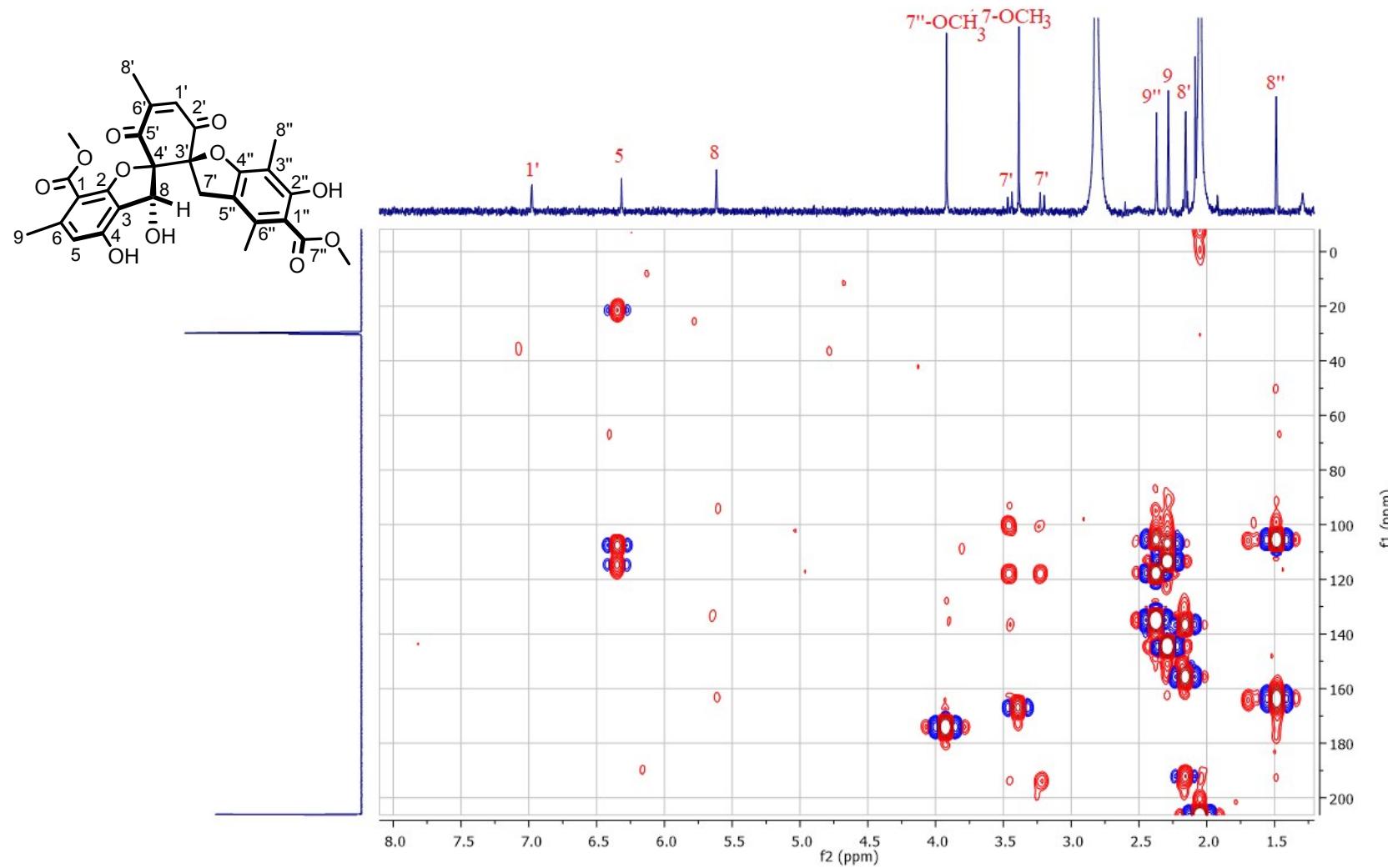
S18. ^1H NMR (acetone- d_6 , 500 MHz) spectrum of **3**



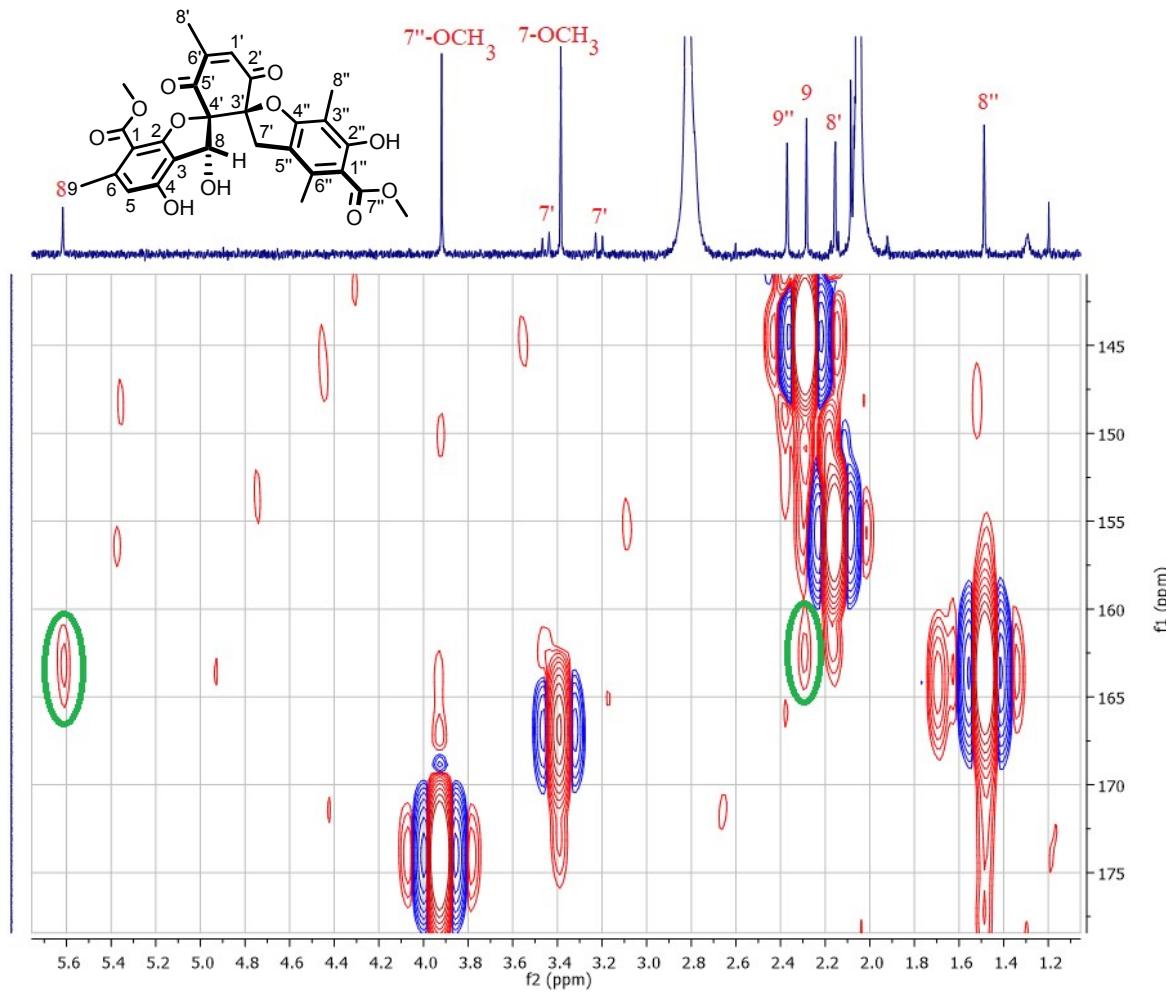
S19. HSQC (acetone-*d*₆, 500 MHz, 125 MHz) spectrum of **3**



S20. HMBC (acetone-*d*₆, 500 MHz, 125 MHz) spectrum of **3**



S21. HMBC (acetone- d_6 , 500 MHz, 125 MHz) spectrum of **3** (closer view)



The two correlations circled in green can be associated to C-2 and C-4 even though these carbons could not be distinguished one from another.

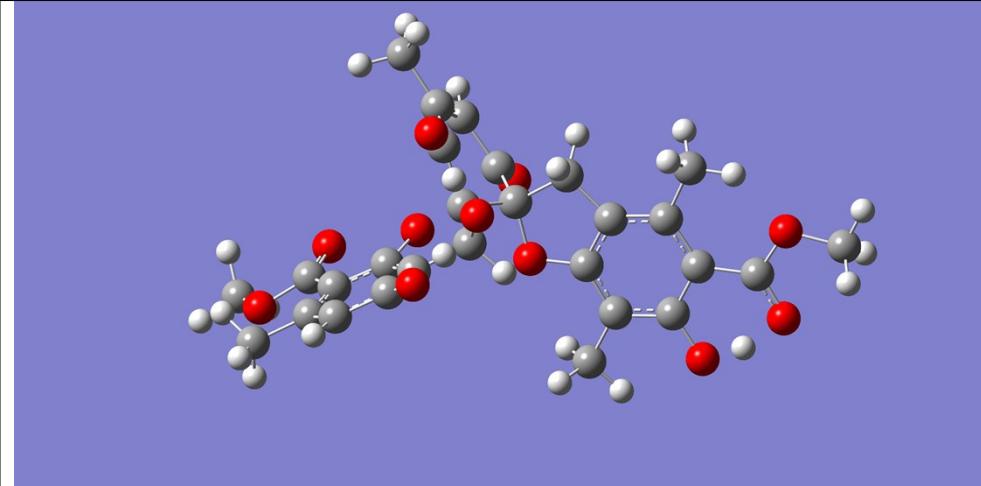
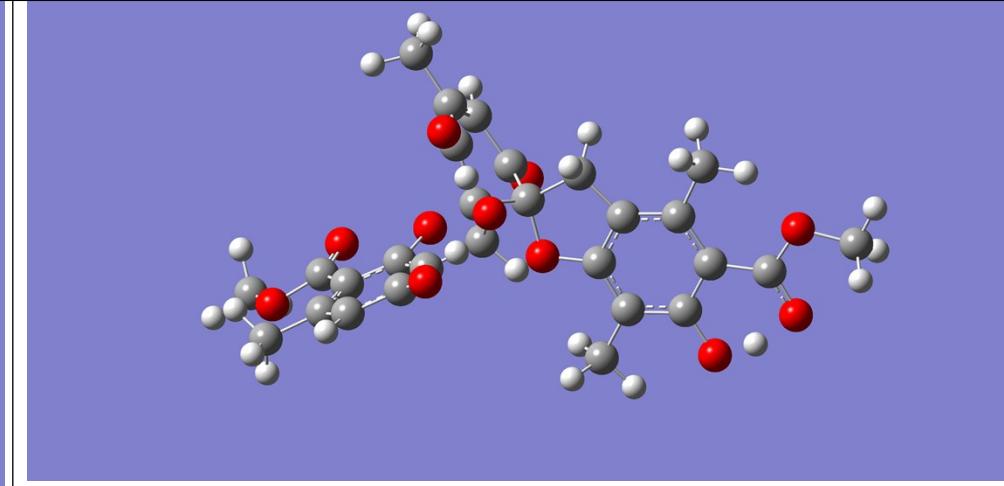
Computational details

All DFT calculations have been performed using Gaussian16¹. After a conformational analysis with GMMX package using the MMFF94 force field with a 1 kcal/mol threshold. 6, 2, 6 and 3 conformers were obtained for the 8S,3'R,4'S, 8R,3'R,4'S, 8R,3'S,4'R, 8R,3'S,4'S diastereoisomers respectively (As compound **2** and **3** are diastereoisomers, the calculation have been performed once). After geometry optimization using DFT at the STO-3G followed by a frequency calculation in order to confirm the presence of a minimum, NMR prediction was performed using the MPW1PW91/6-311+g(2d,p) method as recommended by the Tantillo's group (<http://cheshirenmr.info>). After Boltzmann weighing of the predicted chemical shift of each diastereoisomers, the DP4 parameters were calculated suing the Smith and Goodman Java source code². The molecules visualization is performed using GaussView 6.

¹ Gaussian 16, Revision B.01, M. J. Frisch, G. W. Trucks, H. B. Schlegel, G. E. Scuseria, M. A. Robb, J. R. Cheeseman, G. Scalmani, V. Barone, G. A. Petersson, H. Nakatsuji, X. Li, M. Caricato, A. V. Marenich, J. Bloino, B. G. Janesko, R. Gomperts, B. Mennucci, H. P. Hratchian, J. V. Ortiz, A. F. Izmaylov, J. L. Sonnenberg, D. Williams-Young, F. Ding, F. Lipparini, F. Egidi, J. Goings, B. Peng, A. Petrone, T. Henderson, D. Ranasinghe, V. G. Zakrzewski, J. Gao, N. Rega, G. Zheng, W. Liang, M. Hada, M. Ehara, K. Toyota, R. Fukuda, J. Hasegawa, M. Ishida, T. Nakajima, Y. Honda, O. Kitao, H. Nakai, T. Vreven, K. Throssell, J. A. Montgomery, Jr., J. E. Peralta, F. Ogliaro, M. J. Bearpark, J. J. Heyd, E. N. Brothers, K. N. Kudin, V. N. Staroverov, T. A. Keith, R. Kobayashi, J. Normand, K. Raghavachari, A. P. Rendell, J. C. Burant, S. S. Iyengar, J. Tomasi, M. Cossi, J. M. Millam, M. Klene, C. Adamo, R. Cammi, J. W. Ochterski, R. L. Martin, K. Morokuma, O. Farkas, J. B. Foresman, and D. J. Fox, Gaussian, Inc., Wallingford CT, 2016.

² Assigning Stereochemistry to Single Diastereoisomers by GIAO NMR Calculation: The DP4 Probability S. G. Smith and J. M. Goodman J. Am. Chem. Soc. 2010, 132, 12946-12959

Cartesian coordinates of conformers 8S,3'R,4'S

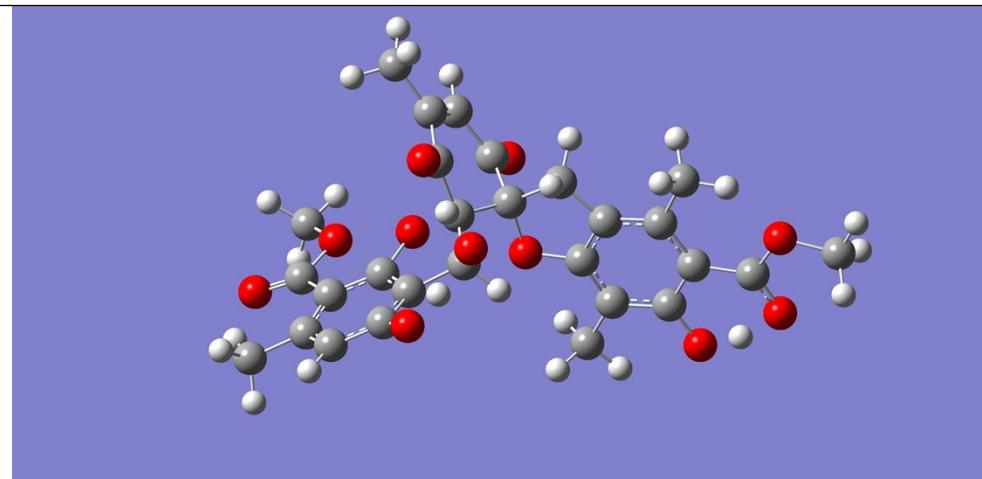
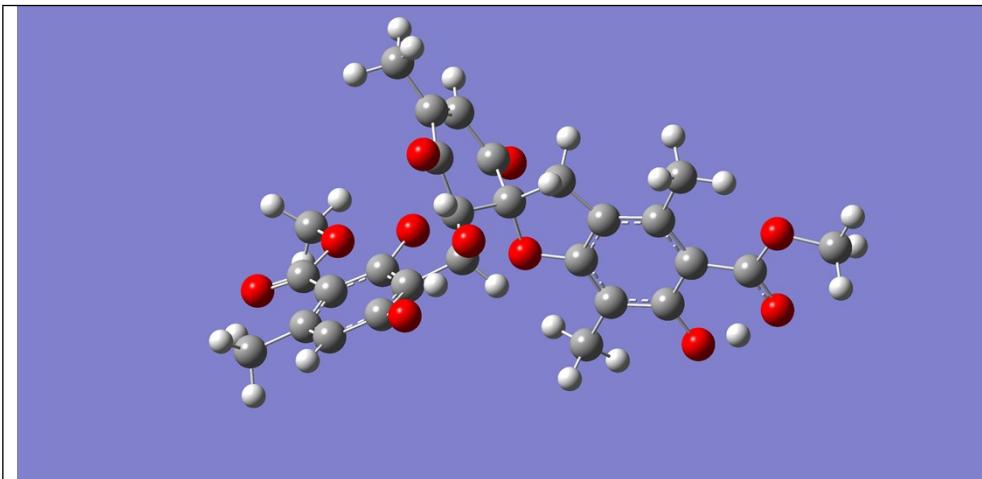
							
C	-1.61360	3.33800	-0.50388	C	-1.61352	3.33777	-0.50504
C	-0.97639	0.90683	0.26882	C	-0.97647	0.90687	0.26863
C	0.28953	1.00829	-0.66583	C	0.28959	1.00797	-0.66587
C	-0.12839	1.84611	-1.96207	C	-0.12804	1.84539	-1.96245
C	-1.00353	3.06886	-1.68911	C	-1.00330	3.06818	-1.69009
C	-0.82749	-0.00040	1.57487	C	-0.82775	0.00012	1.57502
C	-2.18874	-0.68055	1.56203	C	-2.18904	-0.67994	1.56229

C	-2.84347	-0.50661	0.34563	C	-2.84360	-0.50645	0.34574
O	-2.10241	0.32076	-0.56664	O	-2.10239	0.32052	-0.56676
C	1.54649	1.65190	0.06571	C	1.54649	1.65172	0.06565
C	2.62731	0.59208	-0.16686	C	2.62735	0.59188	-0.16671
C	2.03645	-0.52320	-0.83489	C	2.03650	-0.52358	-0.83443
O	0.65208	-0.37244	-1.10747	O	0.65213	-0.37295	-1.10701
C	3.97790	0.60083	0.18560	C	3.97798	0.60079	0.18562
C	4.76206	-0.55833	-0.15421	C	4.76216	-0.55842	-0.15393
C	4.14536	-1.69890	-0.83885	C	4.14543	-1.69926	-0.83820
C	2.74477	-1.67963	-1.18664	C	2.74485	-1.68010	-1.18591
C	-2.82730	-1.18739	2.71623	C	-2.82774	-1.18632	2.71661
C	-4.11862	-1.77695	2.50218	C	-4.11906	-1.77593	2.50263
C	-4.73858	-1.74163	1.23435	C	-4.73885	-1.74107	1.23471
C	-4.13617	-1.05936	0.11090	C	-4.13630	-1.05924	0.11106
O	0.26465	1.54154	-3.11599	O	0.26542	1.54057	-3.11617
C	-2.44903	4.59817	-0.24235	C	-2.44898	4.59804	-0.24410

C	-1.46236	2.36432	0.65139	C	-1.46240	2.36454	0.65063
O	-1.76334	2.67538	1.85263	O	-1.76353	2.67602	1.85171
C	2.10285	-2.87049	-1.90366	C	2.10283	-2.87111	-1.90260
O	4.87310	-2.80593	-1.16976	O	4.87319	-2.80636	-1.16881
C	6.21005	-0.74694	0.12238	C	6.21017	-0.74687	0.12258
O	6.90791	0.29440	0.78070	O	6.90805	0.29467	0.78053
O	6.85654	-1.82049	-0.21385	O	6.85671	-1.82048	-0.21345
C	4.55794	1.82816	0.91256	C	4.55801	1.82832	0.91224
C	-4.74540	-0.81835	-1.26163	C	-4.74536	-0.81873	-1.26162
O	-4.26396	-0.07253	-2.15151	O	-4.26374	-0.07335	-2.15177
O	-5.96567	-1.55847	-1.46203	O	-5.96562	-1.55890	-1.46188
O	-2.22077	-1.00203	3.94704	O	-2.22133	-1.00052	3.94741
C	-6.48860	-1.28232	-2.81801	C	-6.48829	-1.28326	-2.81806
C	-6.12591	-2.40363	1.10845	C	-6.12620	-2.40307	1.10888
O	-0.64392	0.67576	2.88428	O	-0.64429	0.67672	2.88422
C	8.33436	-0.06845	0.97156	C	8.33457	-0.06799	0.97117

H	-1.11641	3.76473	-2.53603	H	-1.11610	3.76370	-2.53731
H	0.01877	-0.71472	1.45014	H	0.01847	-0.71431	1.45064
H	1.33761	1.80789	1.14147	H	1.33753	1.80784	1.14137
H	1.80318	2.63279	-0.37498	H	1.80317	2.63256	-0.37515
H	-4.64971	-2.22751	3.34891	H	-4.65025	-2.22618	3.34946
H	-2.36638	5.30170	-1.08356	H	-2.36711	5.30074	-1.08608
H	-3.51095	4.32951	-0.10603	H	-3.51074	4.32935	-0.10664
H	-2.10797	5.09275	0.68271	H	-2.10725	5.09364	0.68018
H	2.89164	-3.58332	-2.18834	H	2.89154	-3.58397	-2.18743
H	1.37915	-3.38821	-1.25081	H	1.37933	-3.38880	-1.24951
H	1.56493	-2.54331	-2.80885	H	1.56468	-2.54403	-2.80767
H	5.86850	-2.53656	-0.79559	H	5.86866	-2.53679	-0.79485
H	4.42328	2.73420	0.29894	H	4.03297	1.98829	1.86856
H	4.03289	1.98787	1.86892	H	4.42333	2.73419	0.29837
H	5.62919	1.67448	1.10628	H	5.62927	1.67473	1.10597
H	-1.45333	-0.28485	3.67213	H	-1.45383	-0.28347	3.67233

H	-7.40961	-1.88617	-2.91722	H	-7.40956	-1.88674	-2.91701
H	-5.76602	-1.57650	-3.60639	H	-5.76577	-1.57822	-3.60621
H	-6.73371	-0.20920	-2.95540	H	-6.73288	-0.21010	-2.95608
H	-6.45173	-2.78388	2.08784	H	-6.45193	-2.78339	2.08828
H	-6.87453	-1.68763	0.73357	H	-6.09338	-3.24358	0.39615
H	-6.09301	-3.24420	0.39580	H	-6.87485	-1.68703	0.73415
H	-1.21027	1.55116	2.70559	H	-1.21058	1.55208	2.70520
H	8.84188	-0.23673	0.00057	H	8.84140	-0.23860	0.00023
H	8.79023	0.79533	1.48951	H	8.79095	0.79687	1.48688
H	8.43975	-0.97980	1.59365	H	8.44021	-0.97794	1.59529



C	-1.70516	3.29707	0.11216
C	-1.06694	0.76677	0.44696
C	0.22032	1.04313	-0.41987
C	-0.17662	2.09719	-1.55513
C	-1.06401	3.24992	-1.08602
C	-0.94160	-0.35968	1.57034
C	-2.29846	-1.02970	1.40457
C	-2.92214	-0.65022	0.21811
O	-2.16446	0.33208	-0.51074

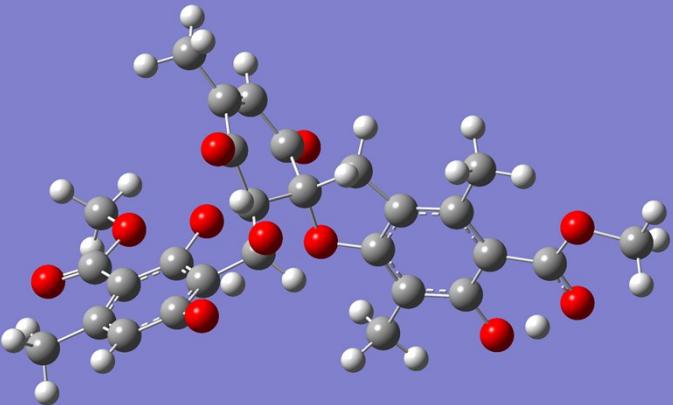
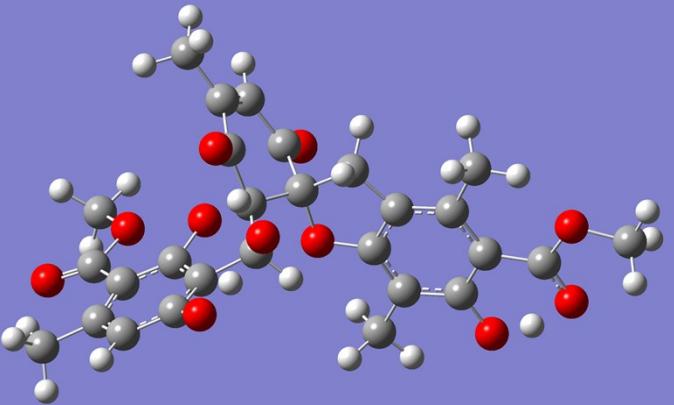
C	-1.73310	3.29329	0.26032
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C	-0.21223	2.19338	-1.48114
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C	-0.90537	-0.41758	1.53509
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O	-2.16490	0.35574	-0.49495

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C	2.00176	-0.39301	-0.84994	C	1.99294	-0.32654	-0.89730
O	0.61154	-0.23329	-1.09000	O	0.60661	-0.14600	-1.14205
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C	4.14412	-1.48392	-1.07244	C	4.12742	-1.42682	-1.14796
C	2.74202	-1.43999	-1.41312	C	2.72842	-1.35757	-1.49614
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C	-2.54974	4.48962	0.58015	C	-2.58933	4.44944	0.79385
C	-1.57667	2.12862	1.07406	C	-1.57630	2.08305	1.16459
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C	2.13007	-2.49134	-2.34271	C	2.11687	-2.36683	-2.47173
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H	-4.77666	-2.89330	2.84078	H	-4.69330	-3.05393	2.73584
H	-2.49944	5.31162	-0.14870	H	-2.51659	5.32546	0.13299
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H	1.71723	-3.34035	-1.76979	H	1.39206	-3.02595	-1.96370
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H	5.89131	-2.26056	-1.19184	H	5.86850	-2.21699	-1.27923
H	4.28023	2.65933	0.89912	H	3.91766	1.54280	2.32717
H	3.94698	1.60120	2.29328	H	5.52542	1.44195	1.53140
H	5.53941	1.50947	1.46775	H	4.30279	2.63436	0.97271
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H -6.54396 -2.26635 -0.43931	H -6.04732 -3.82637 0.33549
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C	-0.21209	2.19339	-1.48113	C	-0.21199	2.19257	-1.48177
C	-1.10742	3.31098	-0.94688	C	-1.10703	3.31056	-0.94786
C	-0.90542	-0.41755	1.53511	C	-0.90567	-0.41719	1.53536
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C	-2.90094	-0.66891	0.19683	C	-2.90111	-0.66875	0.19699
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C	2.55535	0.61882	0.01318	C	2.55540	0.61863	0.01316
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C	4.71507	-0.45999	-0.21529	C	4.71519	-0.46010	-0.21509
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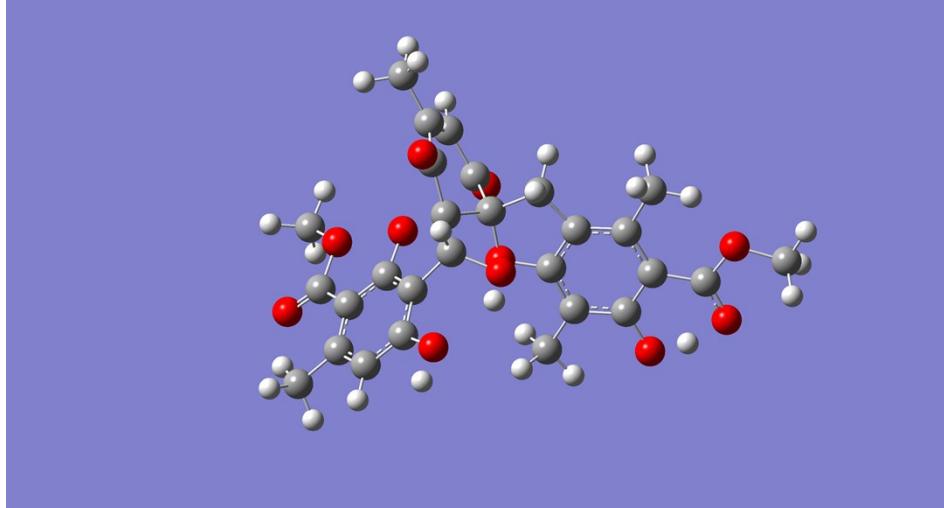
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O	4.88126	-2.41401	-1.71508	O	4.88141	-2.41469	-1.71414
C	6.16558	-0.67707	0.02574	C	6.16576	-0.67696	0.02585
O	6.83660	0.20087	0.91080	O	6.83680	0.20139	0.91051
O	6.83733	-1.63231	-0.53974	O	6.83751	-1.63236	-0.53933
C	4.45242	1.61504	1.36577	C	4.45253	1.61550	1.36521
C	-4.88629	-0.76565	-1.43383	C	-4.88633	-0.76580	-1.43382

O	-6.02016	-1.11505	-1.86003	O	-6.02024	-1.11510	-1.85995
O	-4.05192	0.15071	-2.16510	O	-4.05169	0.15010	-2.16540
O	-2.28780	-1.94795	3.60789	O	-2.28840	-1.94682	3.60849
C	-4.73217	0.55413	-3.41548	C	-4.73178	0.55318	-3.41597
C	-6.14639	-2.73536	0.45764	C	-6.14685	-2.73468	0.45821
O	-0.73689	-0.05073	2.96406	O	-0.73724	-0.04993	2.96421
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H	-1.22194	4.18138	-1.61284	H	-1.22136	4.18079	-1.61408
H	-0.04811	-1.07433	1.25995	H	-0.04839	-1.07412	1.26049
H	1.23028	1.47425	1.55116	H	1.23031	1.47449	1.55086
H	1.68731	2.63585	0.27092	H	1.68731	2.63572	0.27027
H	-4.69343	-3.05375	2.73595	H	-4.69408	-3.05261	2.73669
H	-2.51695	5.32530	0.13258	H	-2.51610	5.32554	0.13100
H	-3.64707	4.14076	0.86173	H	-3.64656	4.14145	0.86039
H	-2.25749	4.72878	1.80774	H	-2.25690	4.72940	1.80633
H	2.92170	-2.98785	-2.89371	H	2.92182	-2.98879	-2.89274

H	1.39223	-3.02605	-1.96373	H	1.39270	-3.02734	-1.96220
H	1.58732	-1.85332	-3.29129	H	1.58689	-1.85479	-3.29005
H	5.86858	-2.21696	-1.27917	H	5.86871	-2.21739	-1.27840
H	3.91783	1.54242	2.32740	H	4.30251	2.63461	0.97211
H	5.52545	1.44206	1.53132	H	3.91799	1.54324	2.32690
H	4.30246	2.63430	0.97306	H	5.52558	1.44262	1.53076
H	-1.53174	-1.17577	3.50756	H	-1.53225	-1.17474	3.50800
H	-4.03389	1.23686	-3.93392	H	-4.03327	1.23545	-3.93470
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H	-6.51654	-2.28887	-0.48318	H	-6.51689	-2.28845	-0.48277
H	-6.04731	-3.82634	0.33548	H	-6.04796	-3.82573	0.33645
H	-1.32061	0.83069	2.98450	H	-1.32085	0.83158	2.98430
H	8.70399	0.56683	1.73269	H	8.78600	-0.09928	0.04960
H	8.39212	-1.19265	1.42979	H	8.70395	0.56708	1.73309

H 8.78555 -0.10072 0.04963	H 8.39244 -1.19225 1.42889
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Cartesian coordinates of conformers 8R,3'R,4'S

	
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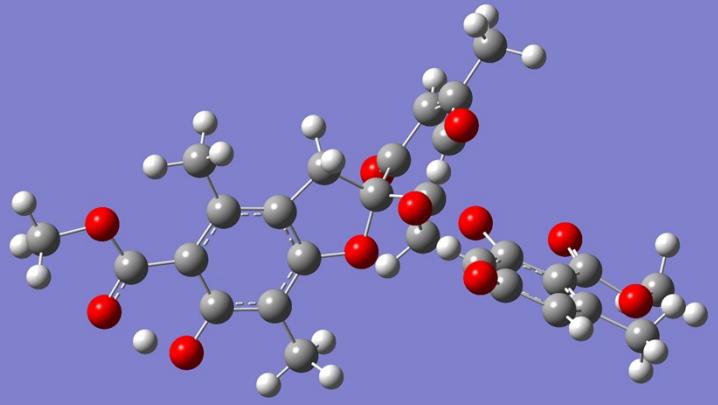
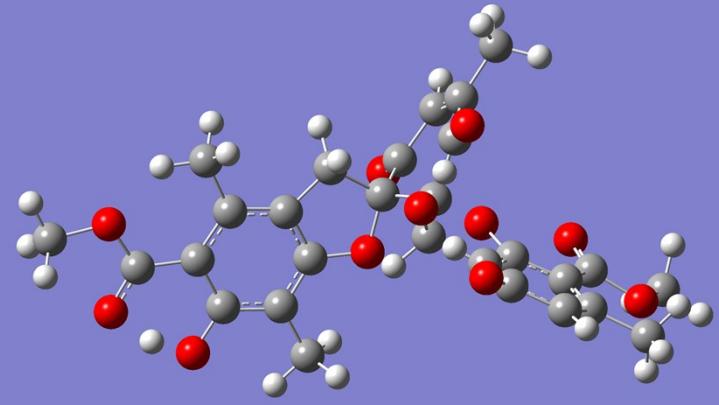
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C	-2.85121	-0.52983	0.47321	C	-2.85434	-0.52578	0.47412
O	-2.41016	0.69986	-0.07478	O	-2.41191	0.70269	-0.07576
C	1.33877	1.76708	0.47891	C	1.33815	1.76272	0.48398
C	2.36195	0.72562	0.01447	C	2.36164	0.72251	0.01751
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O	0.27158	-0.11214	-0.78543	O	0.26900	-0.11865	-0.77419
C	3.74165	0.67777	0.21018	C	3.74155	0.67696	0.20978
C	4.45352	-0.45723	-0.32303	C	4.45423	-0.45829	-0.32290
C	3.73190	-1.51959	-1.03045	C	3.73226	-1.52134	-1.02642
C	2.30370	-1.44482	-1.21187	C	2.30326	-1.44887	-1.20585
C	-2.40168	-2.16095	2.24243	C	-2.40484	-2.15397	2.24603
C	-3.43322	-2.98254	1.71161	C	-3.43312	-2.97886	1.71417
C	-4.17798	-2.57518	0.58155	C	-4.17699	-2.57406	0.58262
C	-3.90125	-1.33183	-0.07659	C	-3.90156	-1.33088	-0.07680

O	-0.13172	1.94027	-2.61255	O	-0.12677	1.92653	-2.61278
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C	-1.61121	2.59044	1.30720	C	-1.61240	2.59739	1.30075
O	-1.86647	2.80220	2.52047	O	-1.87384	2.81342	2.51201
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O	-4.21948	0.39186	-1.75084	O	-4.21971	0.38909	-1.75446
O	-1.57067	-2.49432	3.33769	O	-1.57272	-2.48313	3.34191
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C	-5.29013	-3.50134	0.05199	C	-5.28658	-3.50276	0.05181

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H	5.42567	-2.38573	-1.26138	H	5.42143	-2.39222	-1.25801
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H	4.25080	2.78357	0.47677	H	5.51582	1.63970	1.01995
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H	-6.05190	0.88352	-2.76995	H	-4.56921	1.78872	-3.24622
H	-4.55924	1.78895	-3.24744	H	-6.05294	0.86163	-2.78127
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H	0.10501	-1.21433	2.73366	H	0.08864	-1.21014	2.74309
H	8.67879	0.68100	0.94396	H	8.68214	0.68376	0.93283
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Cartesian coordinates of conformers of the 8R,3'S,4'R

	
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C	-2.03656	-0.52375	-0.83425	C	-2.03649	-0.52355	-0.83451
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C	-3.97804	0.60080	0.18558	C	-3.97797	0.60082	0.18556
C	-4.76224	-0.55843	-0.15385	C	-4.76215	-0.55841	-0.15397
C	-4.14552	-1.69936	-0.83795	C	-4.14542	-1.69924	-0.83822
C	-2.74493	-1.68030	-1.18561	C	-2.74482	-1.68008	-1.18594
C	2.82796	-1.18590	2.71677	C	2.82770	-1.18632	2.71661
C	4.11927	-1.77554	2.50279	C	4.11902	-1.77591	2.50265
C	4.73898	-1.74085	1.23483	C	4.73884	-1.74104	1.23474
C	4.13636	-1.05919	0.11112	C	4.13630	-1.05922	0.11109
O	-0.26558	1.53999	-3.11626	O	-0.26542	1.54065	-3.11618
C	2.44893	4.59797	-0.24483	C	2.44906	4.59802	-0.24408
C	1.46244	2.36460	0.65030	C	1.46240	2.36455	0.65063
O	1.76367	2.67626	1.85132	O	1.76351	2.67603	1.85172

C	-2.10290	-2.87142	-1.90212	C	-2.10289	-2.87116	-1.90261
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C	-6.21028	-0.74681	0.12262	C	-6.21015	-0.74688	0.12259
O	-6.90813	0.29483	0.78046	O	-6.90804	0.29467	0.78050
O	-6.85684	-1.82041	-0.21332	O	-6.85666	-1.82054	-0.21336
C	-4.55807	1.82844	0.91203	C	-4.55801	1.82833	0.91220
C	4.74536	-0.81887	-1.26163	C	4.74540	-0.81870	-1.26158
O	4.26366	-0.07369	-2.15190	O	4.26392	-0.07316	-2.15167
O	5.96568	-1.55898	-1.46177	O	5.96549	-1.55914	-1.46190
O	2.22162	-0.99991	3.94757	O	2.22127	-1.00052	3.94741
C	6.48825	-1.28352	-2.81802	C	6.48820	-1.28351	-2.81806
C	6.12635	-2.40281	1.10902	C	6.12619	-2.40302	1.10893
O	0.64448	0.67713	2.88423	O	0.64424	0.67673	2.88421
C	-8.33465	-0.06778	0.97119	C	-8.33454	-0.06803	0.97125
H	1.11584	3.76329	-2.53781	H	1.11618	3.76372	-2.53731
H	-0.01835	-0.71414	1.45091	H	-0.01851	-0.71429	1.45061

H	-1.33756	1.80783	1.14131		H	-1.33757	1.80784	1.14133
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H	2.36621	5.30099	-1.08647		H	2.36703	5.30083	-1.08595
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H	3.51085	4.32937	-0.10845		H	3.51084	4.32931	-0.10685
H	-1.37941	-3.38902	-1.24894		H	-1.37885	-3.38840	-1.24977
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H	5.76555	-1.57827	-3.60608		H	5.76559	-1.57821	-3.60623
H	6.73315	-0.21043	-2.95608		H	6.73308	-0.21040	-2.95599

H	7.40934	-1.88727	-2.91707		H	7.40931	-1.88723	-2.91709
H	6.09376	-3.24288	0.39576		H	6.09334	-3.24368	0.39638
H	6.87514	-1.68654	0.73498		H	6.87479	-1.68704	0.73399
H	6.45178	-2.78371	2.08829		H	6.45201	-2.78314	2.08838
H	1.21078	1.55246	2.70502		H	1.21055	1.55208	2.70519
H	-8.84180	-0.23731	0.00022		H	-8.84149	-0.23839	0.00032
H	-8.44028	-0.97835	1.59440		H	-8.44010	-0.97815	1.59514
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C	-0.21251	1.09111	-0.40341	C	-0.21254	1.09086	-0.40350
C	0.21198	2.19292	-1.48143	C	0.21183	2.19239	-1.48187
C	1.10715	3.31073	-0.94737	C	1.10689	3.31045	-0.94812
C	0.90559	-0.41741	1.53525	C	0.90579	-0.41705	1.53550
C	2.25662	-1.09579	1.35588	C	2.25685	-1.09539	1.35619
C	2.90106	-0.66885	0.19689	C	2.90116	-0.66871	0.19703
O	2.16488	0.35557	-0.49506	O	2.16490	0.35550	-0.49510
C	-1.44987	1.57468	0.47082	C	-1.44990	1.57463	0.47061
C	-2.55539	0.61869	0.01322	C	-2.55544	0.61860	0.01315
C	-1.99302	-0.32688	-0.89706	C	-1.99304	-0.32723	-0.89684
O	-0.60667	-0.14645	-1.14179	O	-0.60666	-0.14695	-1.14149
C	-3.90368	0.57459	0.37203	C	-3.90375	0.57464	0.37190
C	-4.71516	-0.46005	-0.21515	C	-4.71523	-0.46012	-0.21506
C	-4.12756	-1.42709	-1.14761	C	-4.12761	-1.42742	-1.14725
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C	2.88899	-1.86237	2.36396	C	2.88931	-1.86175	2.36438
C	4.16610	-2.41553	2.01701	C	4.16639	-2.41496	2.01746
C	4.77446	-2.10908	0.78170	C	4.77464	-2.10878	0.78203
C	4.18105	-1.18654	-0.15839	C	4.18113	-1.18648	-0.15823
O	-0.18847	2.16064	-2.67203	O	-0.18860	2.15971	-2.67246
C	2.58917	4.44958	0.79287	C	2.58885	4.44991	0.79177
C	1.57627	2.08322	1.16420	C	1.57627	2.08353	1.16374
O	1.89293	2.10949	2.40068	O	1.89307	2.11012	2.40017
C	-2.11706	-2.36740	-2.47120	C	-2.11706	-2.36818	-2.47043
O	-4.88142	-2.41429	-1.71465	O	-4.88146	-2.41477	-1.71403
C	-6.16570	-0.67698	0.02583	C	-6.16578	-0.67696	0.02592
O	-6.83671	0.20114	0.91072	O	-6.83682	0.20141	0.91055
O	-6.83749	-1.63226	-0.53953	O	-6.83756	-1.63238	-0.53923
C	-4.45246	1.61524	1.36556	C	-4.45255	1.61556	1.36515
C	4.88632	-0.76567	-1.43386	C	4.88629	-0.76589	-1.43385
O	6.02019	-1.11505	-1.86007	O	6.02013	-1.11536	-1.86007

O	4.05183	0.15051	-2.16524	O	4.05174	0.15012	-2.16538
O	2.28824	-1.94735	3.60820	O	2.28864	-1.94648	3.60868
C	4.73195	0.55377	-3.41574	C	4.73178	0.55310	-3.41601
C	6.14670	-2.73496	0.45786	C	6.14688	-2.73470	0.45821
O	0.73713	-0.05037	2.96414	O	0.73742	-0.04966	2.96431
C	-8.26994	-0.16624	1.02844	C	-8.27007	-0.16587	1.02838
H	1.22155	4.18104	-1.61347	H	1.22115	4.18061	-1.61444
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H	-1.23027	1.47423	1.55108	H	-1.23034	1.47436	1.55090
H	-1.68728	2.63572	0.27073	H	-1.68726	2.63565	0.27034
H	4.69390	-3.05309	2.73631	H	4.69426	-3.05237	2.73684
H	2.51624	5.32550	0.13190	H	2.51596	5.32558	0.13045
H	2.25744	4.72884	1.80712	H	2.25696	4.72956	1.80586
H	3.64686	4.14118	0.86064	H	3.64654	4.14159	0.85980
H	-1.39247	-3.02666	-1.96302	H	-1.39209	-3.02692	-1.96215
H	-2.92185	-2.98839	-2.89316	H	-2.92180	-2.98962	-2.89183

H	-1.58728	-1.85406	-3.29074	H	-1.58774	-1.85509	-3.29043
H	-5.86873	-2.21711	-1.27882	H	-5.86881	-2.21743	-1.27829
H	-4.30242	2.63443	0.97268	H	-3.91811	1.54325	2.32688
H	-5.52551	1.44234	1.53108	H	-4.30241	2.63464	0.97205
H	-3.91792	1.54276	2.32723	H	-5.52563	1.44277	1.53061
H	1.53211	-1.17526	3.50780	H	1.53250	-1.17445	3.50817
H	4.94944	-0.31825	-4.06555	H	4.94897	-0.31904	-4.06576
H	4.03310	1.23544	-3.93480	H	4.03300	1.23487	-3.93505
H	5.68557	1.08348	-3.21401	H	5.68555	1.08261	-3.21448
H	6.86002	-2.54741	1.27564	H	6.04793	-3.82574	0.33654
H	6.04774	-3.82597	0.33592	H	6.51684	-2.28854	-0.48285
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H	-8.70416	0.56737	1.73234	H	-8.70419	0.56778	1.73230
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H	-8.39234	-1.19219	1.42984	H	-8.39252	-1.19182	1.42979

C 1.73299 3.29331 0.25962 C 1.05954 0.75867 0.46737 C -0.21250 1.09116 -0.40345 C 0.21201 2.19296 -1.48147 C 1.10720 3.31075 -0.94742 C 0.90555 -0.41734 1.53525 C 2.25658 -1.09574 1.35591 C 2.90103 -0.66883 0.19692	C 1.73276 3.29332 0.25895 C 1.05958 0.75865 0.46729 C -0.21254 1.09083 -0.40350 C 0.21183 2.19240 -1.48183 C 1.10691 3.31044 -0.94805 C 0.90579 -0.41714 1.53544 C 2.25686 -1.09547 1.35613 C 2.90119 -0.66874 0.19700

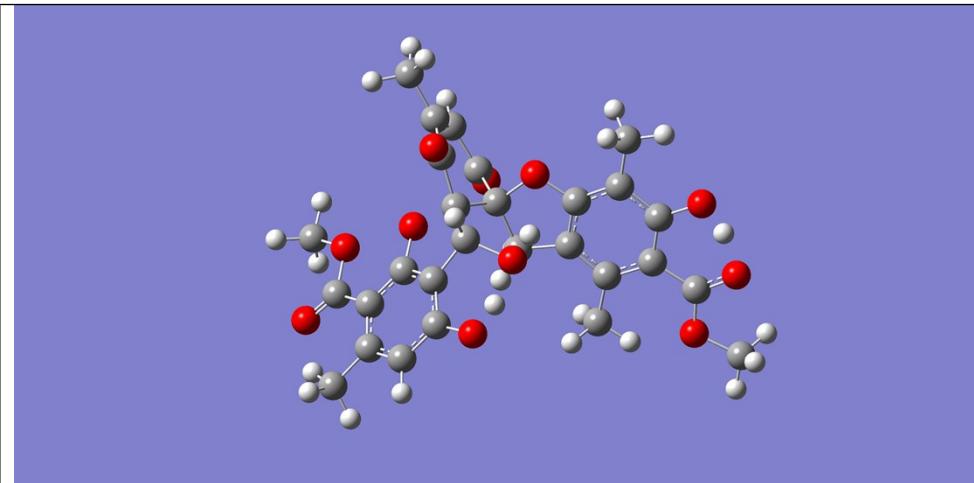
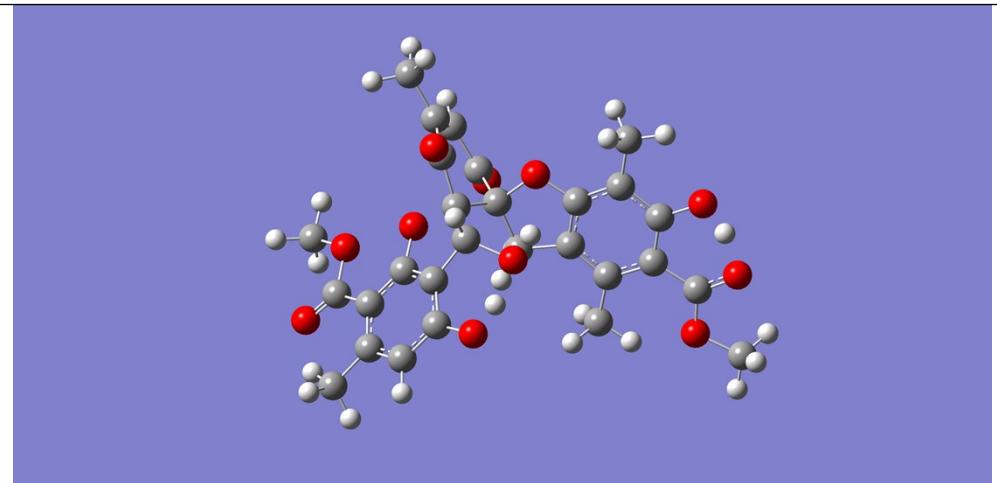
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C	-1.44988	1.57475	0.47075	C	-1.44989	1.57460	0.47064
C	-2.55538	0.61872	0.01317	C	-2.55545	0.61862	0.01313
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C	-3.90367	0.57461	0.37198	C	-3.90375	0.57466	0.37191
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C	4.16601	-2.41553	2.01708	C	4.16648	-2.41492	2.01744
C	4.77439	-2.10910	0.78177	C	4.77473	-2.10870	0.78203
C	4.18102	-1.18656	-0.15834	C	4.18120	-1.18641	-0.15823
O	-0.18844	2.16069	-2.67208	O	-0.18861	2.15977	-2.67242
C	2.58922	4.44960	0.79282	C	2.58885	4.44985	0.79189
C	1.57628	2.08327	1.16418	C	1.57625	2.08345	1.16377

O	1.89293	2.10955	2.40066	O	1.89305	2.11001	2.40021
C	-2.11696	-2.36739	-2.47118	C	-2.11716	-2.36810	-2.47054
O	-4.88134	-2.41434	-1.71463	O	-4.88154	-2.41466	-1.71412
C	-6.16567	-0.67702	0.02581	C	-6.16582	-0.67695	0.02596
O	-6.83669	0.20110	0.91071	O	-6.83682	0.20139	0.91064
O	-6.83743	-1.63232	-0.53953	O	-6.83760	-1.63235	-0.53919
C	-4.45247	1.61527	1.36550	C	-4.45252	1.61557	1.36518
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O	6.02017	-1.11515	-1.86000	O	6.02025	-1.11511	-1.86001
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C	6.14664	-2.73500	0.45796	C	6.14701	-2.73455	0.45827
O	0.73708	-0.05028	2.96414	O	0.73742	-0.04978	2.96427
C	-8.26991	-0.16630	1.02853	C	-8.27005	-0.16596	1.02855
H	1.22162	4.18106	-1.61353	H	1.22118	4.18062	-1.61434

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H	-1.23029	1.47435	1.55102	H	-1.23034	1.47426	1.55092
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H	2.51636	5.32549	0.13180	H	2.51636	5.32536	0.13032
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H	-5.52551	1.44233	1.53106	H	-3.91790	1.54343	2.32682
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H	4.03288	1.23481	-3.93512	H	4.03262	1.23438	-3.93537

H	5.68530	1.08373	-3.21405	H	5.68516	1.08295	-3.21461
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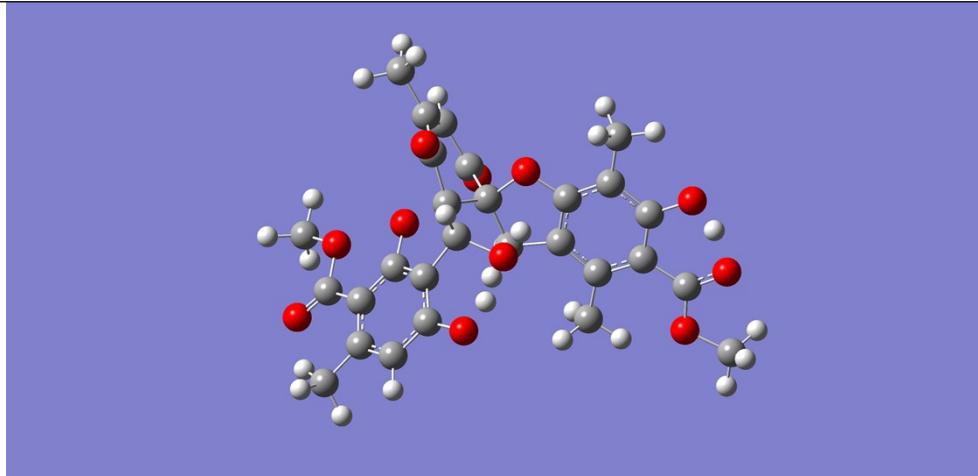
Cartesian coordinates of conformers of the 8S,3'R,4'S-3

	
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O	0.94292	2.02069	0.20981	O	0.94293	2.02079	0.20968
C	2.99889	-0.85775	-0.86566	C	2.99894	-0.85759	-0.86588
C	4.29938	-0.47104	-0.38069	C	4.29938	-0.47095	-0.38077
C	4.48311	0.80133	0.32243	C	4.48309	0.80139	0.32243
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O	-0.45122	1.85074	-2.88304	O	-0.45127	1.85126	-2.88305
C	-2.65005	4.89466	0.39843	C	-2.65029	4.89443	0.39898
C	-1.73850	2.55796	1.08187	C	-1.73831	2.55779	1.08210
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O	5.70843	1.18618	0.78878	O	5.70838	1.18614	0.78898
C	5.55467	-1.25494	-0.52068	C	5.55464	-1.25492	-0.52063
O	5.49476	-2.50277	-1.18565	O	5.49476	-2.50270	-1.18569
O	6.69622	-0.84327	-0.06028	O	6.69615	-0.84334	-0.06004
C	2.73341	-2.17782	-1.61228	C	2.73348	-2.17761	-1.61260
C	-4.72189	-1.38502	-1.10845	C	-4.72201	-1.38489	-1.10833
O	-5.60662	-2.13439	-1.60347	O	-5.60681	-2.13419	-1.60334
O	-4.47859	-0.06276	-1.61750	O	-4.47865	-0.06263	-1.61736
O	-0.83505	-2.52238	3.05396	O	-0.83484	-2.52272	3.05361
C	-5.39349	0.21144	-2.74797	C	-5.39359	0.21163	-2.74778
C	-4.83066	-3.99992	0.37041	C	-4.83087	-3.99983	0.37044
O	0.30206	-0.41164	2.08001	O	0.30231	-0.41206	2.07959
C	6.83513	-3.13874	-1.23126	C	6.83509	-3.13876	-1.23124
H	-1.58681	4.15412	-2.05391	H	-1.58739	4.15419	-2.05359
H	-1.35202	0.78422	2.73226	H	-1.35152	0.78396	2.73219

H	-0.03470	-0.98882	-0.60357	H	-0.03465	-0.98870	-0.60415
H	0.31558	-0.10372	-2.13206	H	0.31571	-0.10328	-2.13244
H	-2.86120	-4.21631	2.23664	H	-2.86120	-4.21646	2.23644
H	-2.59998	5.64995	-0.39942	H	-2.60191	5.64913	-0.39953
H	-3.70971	4.67300	0.61396	H	-3.70947	4.67234	0.61641
H	-2.20307	5.30560	1.31920	H	-2.20206	5.30637	1.31870
H	4.63719	3.14960	1.48344	H	4.63689	3.14904	1.48471
H	3.21316	3.86596	0.66077	H	3.21423	3.86616	0.66044
H	3.01301	3.04310	2.22796	H	3.01174	3.04340	2.22740
H	6.33660	0.34079	0.48039	H	6.33654	0.34070	0.48065
H	1.99284	-2.78235	-1.06292	H	2.32133	-1.97077	-2.61401
H	2.32140	-1.97103	-2.61377	H	3.66848	-2.74695	-1.71205
H	3.66837	-2.74723	-1.71158	H	1.99304	-2.78227	-1.06320
H	-0.20763	-1.69078	2.85411	H	-0.20739	-1.69117	2.85372
H	-5.24189	-0.50316	-3.58252	H	-5.15318	1.23495	-3.09037
H	-6.45718	0.16377	-2.43721	H	-5.24255	-0.50339	-3.58208

H -5.15357 1.23502 -3.09013	H -6.45726 0.16468 -2.43680
H -4.32773 -4.94653 0.11766	H -4.32804 -4.94649 0.11765
H -5.51307 -4.19141 1.21449	H -5.51325 -4.19127 1.21454
H -5.40546 -3.62855 -0.49751	H -5.40568 -3.62840 -0.49745
H 0.79593 0.30039 2.62580	H 0.79638 0.29989 2.62531
H 6.68730 -4.09652 -1.76323	H 6.68736 -4.09619 -1.76386
H 7.56239 -2.50945 -1.78242	H 7.56261 -2.50919 -1.78173
H 7.22653 -3.32995 -0.21199	H 7.22610 -3.33066 -0.21195
	
C -1.91264 3.61300 -0.01243	

C	-1.31946	1.10373	0.57722
C	-0.14959	1.24090	-0.47789
C	-0.68033	2.15102	-1.68278
C	-1.43186	3.40190	-1.26463
C	-1.04102	0.17424	1.84473
C	-1.96018	-0.99160	1.55188
C	-2.80314	-0.71646	0.47082
O	-2.53185	0.54411	-0.14484
C	0.46039	-0.10016	-1.03344
C	1.93612	0.01941	-0.63978
C	2.12704	1.25623	0.04753
O	0.94294	2.02076	0.20971
C	2.99893	-0.85762	-0.86586
C	4.29940	-0.47098	-0.38078
C	4.48311	0.80136	0.32240
C	3.36593	1.68729	0.54182

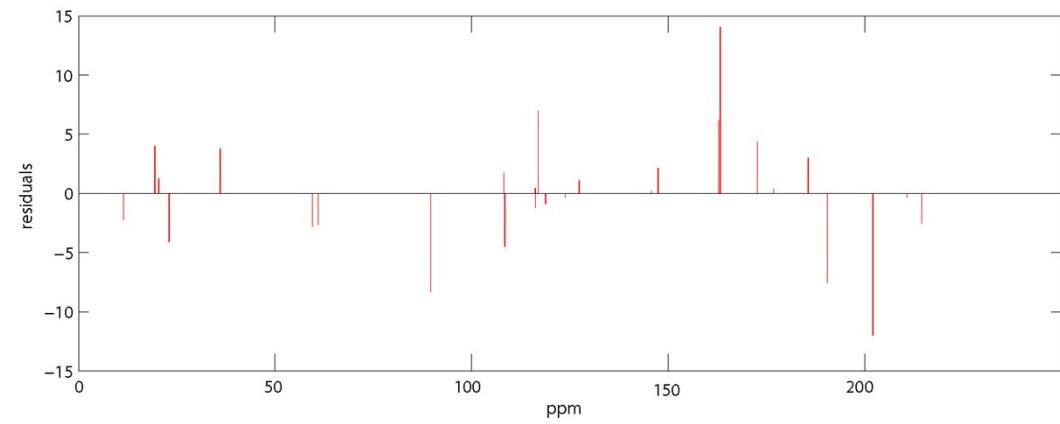
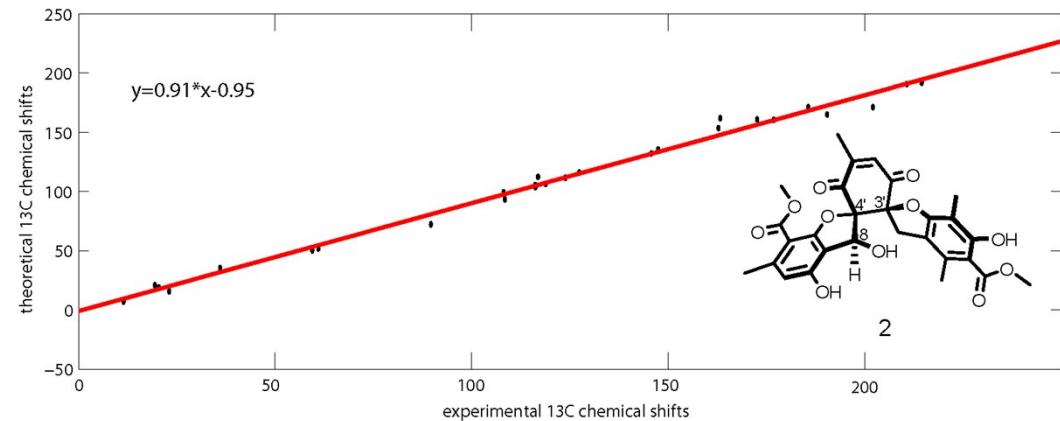
C	-1.87696	-2.26252	2.16553
C	-2.85786	-3.22399	1.77033
C	-3.79469	-2.92480	0.75696
C	-3.77823	-1.66962	0.04759
O	-0.45128	1.85116	-2.88306
C	-2.65025	4.89445	0.39890
C	-1.73828	2.55782	1.08207
O	-1.94380	2.78739	2.30223
C	3.56486	3.01840	1.27269
O	5.70839	1.18610	0.78896
C	5.55466	-1.25495	-0.52065
O	5.49477	-2.50273	-1.18571
O	6.69618	-0.84337	-0.06009
C	2.73346	-2.17766	-1.61255
C	-4.72207	-1.38487	-1.10832
O	-5.60693	-2.13414	-1.60326

O	-4.47864	-0.06266	-1.61745
O	-0.83489	-2.52265	3.05364
C	-5.39360	0.21154	-2.74787
C	-4.83090	-3.99979	0.37047
O	0.30227	-0.41202	2.07967
C	6.83511	-3.13875	-1.23122
H	-1.58729	4.15418	-2.05364
H	-1.35158	0.78400	2.73220
H	-0.03464	-0.98872	-0.60406
H	0.31568	-0.10335	-2.13238
H	-2.86126	-4.21640	2.23649
H	-2.60117	5.64945	-0.39928
H	-3.70963	4.67250	0.61550
H	-2.20258	5.30592	1.31910
H	4.63700	3.14892	1.48477
H	3.21447	3.86612	0.66035

H	3.01180	3.04350	2.22735
H	6.33656	0.34069	0.48061
H	1.99309	-2.78234	-1.06309
H	2.32122	-1.97083	-2.61394
H	3.66848	-2.74696	-1.71207
H	-0.20745	-1.69108	2.85374
H	-6.45724	0.16540	-2.43669
H	-5.15264	1.23453	-3.09103
H	-5.24313	-0.50401	-3.58181
H	-4.32806	-4.94642	0.11759
H	-5.51322	-4.19130	1.21461
H	-5.40577	-3.62832	-0.49736
H	0.79632	0.29988	2.62546
H	6.68738	-4.09629	-1.76364
H	7.56257	-2.50926	-1.78188
H	7.22621	-3.33043	-0.21191

Calculation results for compound 2

	R2	RMSD	DP4
8S,3'R,4'S	0,9932	2,898645426	0%
8R,3'R,4'S	0,9957	2,704296412	1,2%
8R,3'S,4'R	0,9932	2,897847248	0%
8R,3'S,4'S	0,9959	2,717420034	98,6%



Calculation results for compound 3

	R2	RMSD	DP4
8S,3'R,4'S	0,9954	2,852029384	0%
8R,3'R,4'S	0,9973	2,6351447	99,90%
8R,3'S,4'R	0,9954	2,8514905	0%
8R,3'S,4'S	0,9970	2,681839412	0%

