Vulgarin, a sesquiterpene lactone from *Artemisia judaica* improves the antidiabetic effectiveness of glibenclamide in streptozotocin-induced diabetic rats via modulation of PEPCK and G6Pase genes expression

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Vulgarin (VGN): Colourless crystals, m.p. 175 ^{0}C; $[\alpha]^{25}_D$ = + 43; UV λmax 216 nm; ^{1}H and ^{13}C NMR Table S1; HRESIMS $[M+1]^+$ *m/z* 265.1429 (calcd for $C_{15}H_{20}O_4$+H, 265.1440, 6%), $[M+Na]^+$ *m/z* 287.1247 (calcd for $C_{15}H_{20}O_4$+Na, 287.1259, 100%), $[M-1]^+$ *m/z* 263.1287 (calcd for $C_{15}H_{20}O_4$-H, 263.1283, 100%).

4-Epivulgarin (VGN): Colourless crystals, m.p. 193 ^{0}C; $[\alpha]^{25}_D$ = + 82; UV λmax 215 nm; ^{1}H and ^{13}C NMR Table S1; HRESIMS $[M+1]^+$ *m/z* 265.1429 (calcd for $C_{15}H_{20}O_4$+H, 265.1440, 55%), $[M+Na]^+$ *m/z* 287.1248 (calcd for $C_{15}H_{20}O_4$+Na, 287.1259, 100%), $[M-1]^+$ *m/z* 263.1288 (calcd for $C_{15}H_{20}O_4$-H, 263.1288, 100%).

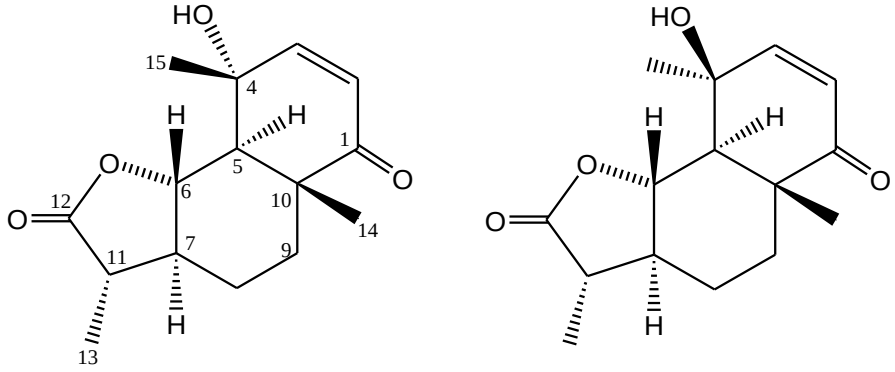

Table S1. ^{1}H and ^{13}C NMR data for VGN and eVGN ($CDCl_3$, δ in ppm).

	Vulgarin (VGN)		**4-Epivulgarin (eVGN)**	
	^{1}H	**^{13}C**	**^{1}H**	**^{13}C**
1	**-**	201.80	**-**	203.64
2	5.72 (d, *J*= 10.3 Hz)	125.31	5.72 (d, *J*= 10.3 Hz)	124.64
3	6.47 (d, *J*= 10.3 Hz)	152.03	6.42 (d, *J*= 10.3 Hz)	151.22
4	**-**	69.91	**-**	67.76
5	2.27 (d, *J*= 10.95 Hz)	54.39	1.88 (d, *J*= 10.95 Hz)	50.97
6	4.06 (t, *J*= 11 Hz)	79.41	4.25 (t, *J*= 10.75 Hz)	79.34
7	1.54 (m)	52.19	1.55 (m)	52.20
8	1.37 (m), 1.85 (m)	22.53	1.39 (m), 1.81 (m)	22.61
9	1.37 (m), 1.85 (m)	34.01	1.39 (m), 1.81 (m)	32.52
10	**-**	46.25	**-**	45.97
11	2.22 (m)	40.39	2.21 (h, *J*= 6.85 Hz)	40.71
12	**-**	178.43	**-**	179.46
13	1.09 (d, *J*= 6.95 Hz)	12.39	1.09 (d, *J*= 6.95 Hz)	12.39
14	1.07 (s)	19.71	1.20 (s)	20.65
15	1.41 (s)	23.56	1.44 (s)	31.09
OH	2.95 (s)	-	3.03 (s)	-

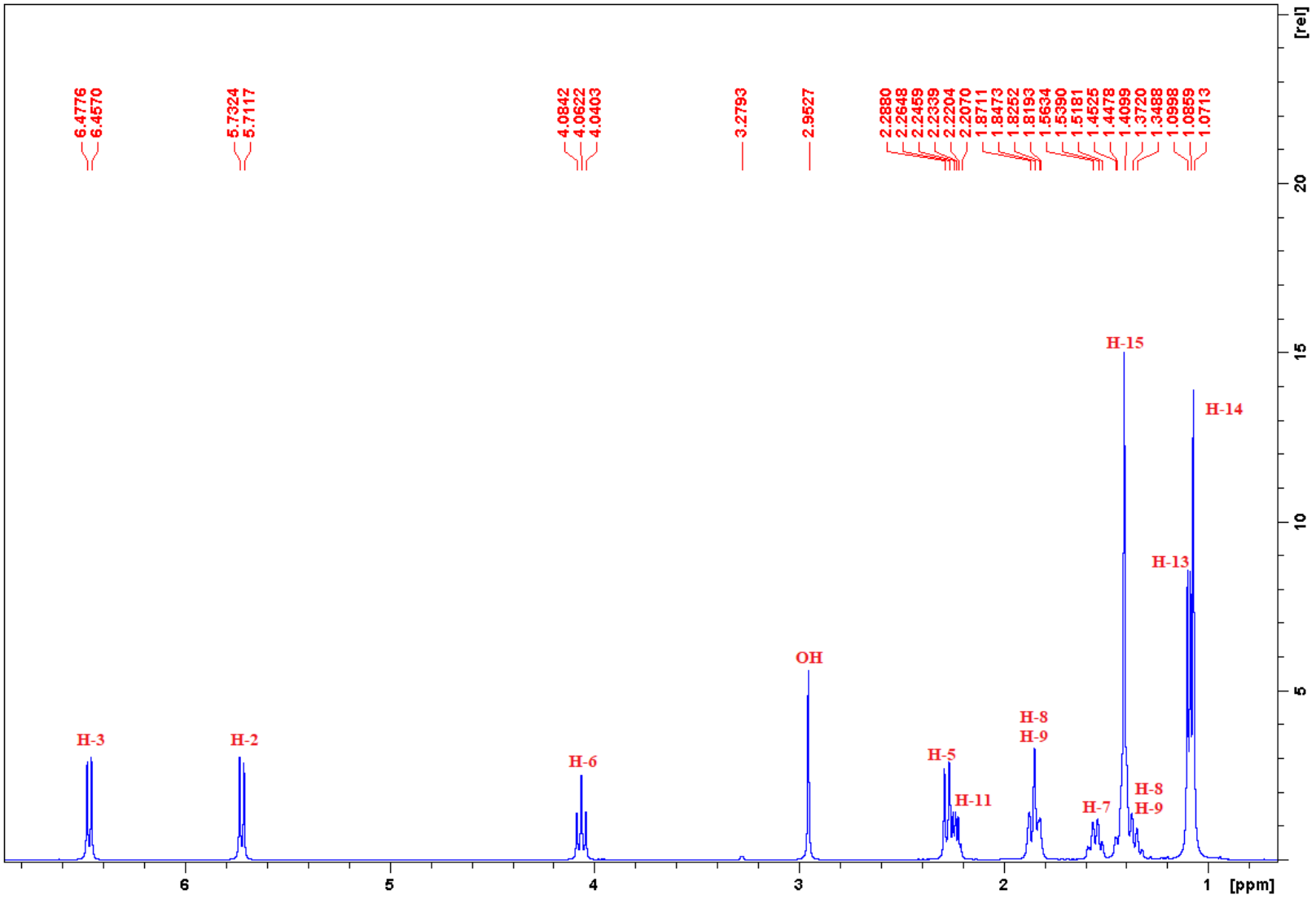

Figure S1: ^{1}H NMR data for VGN.

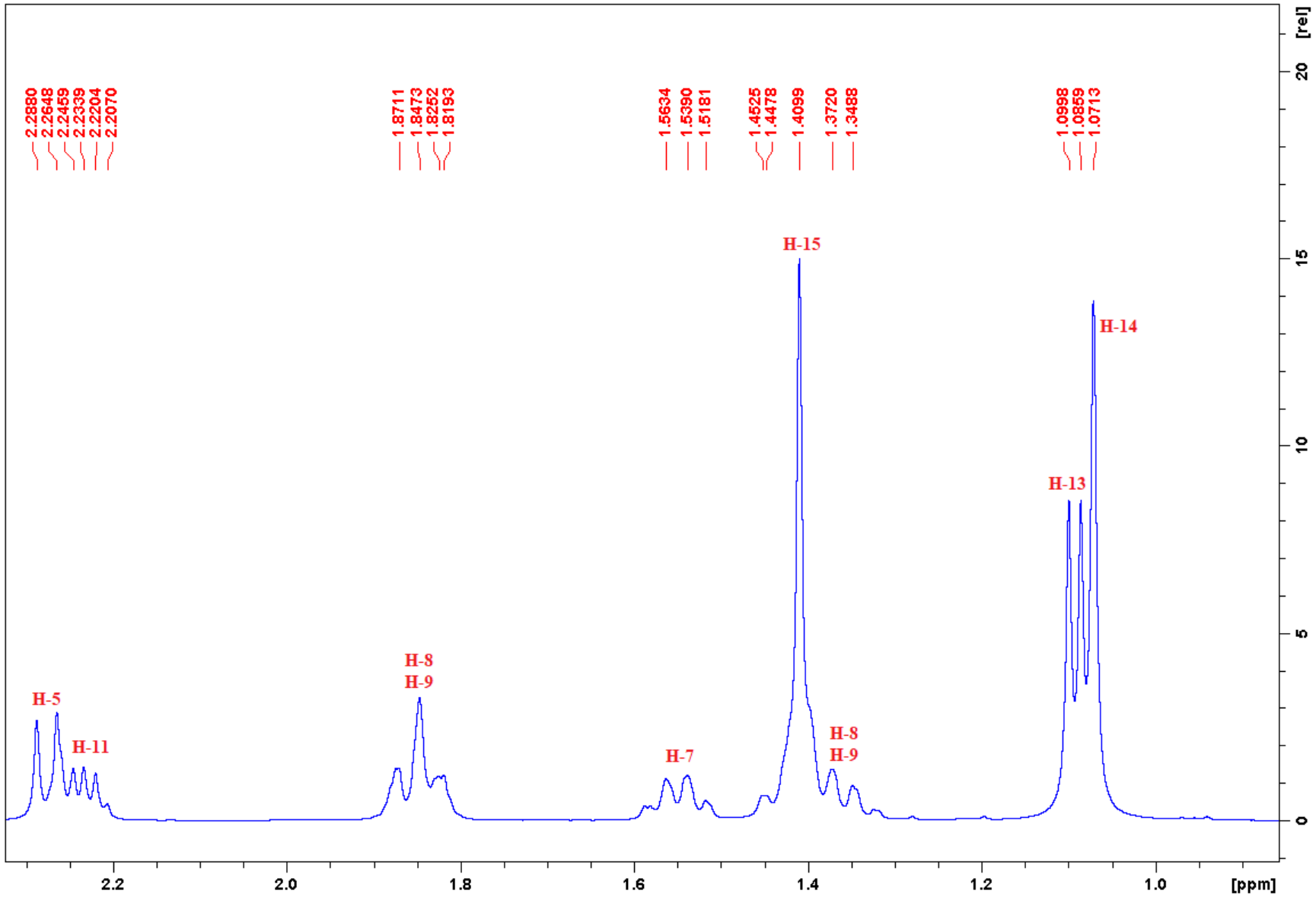

Figure S2: ^{1}H NMR data for VGN (Exp.).

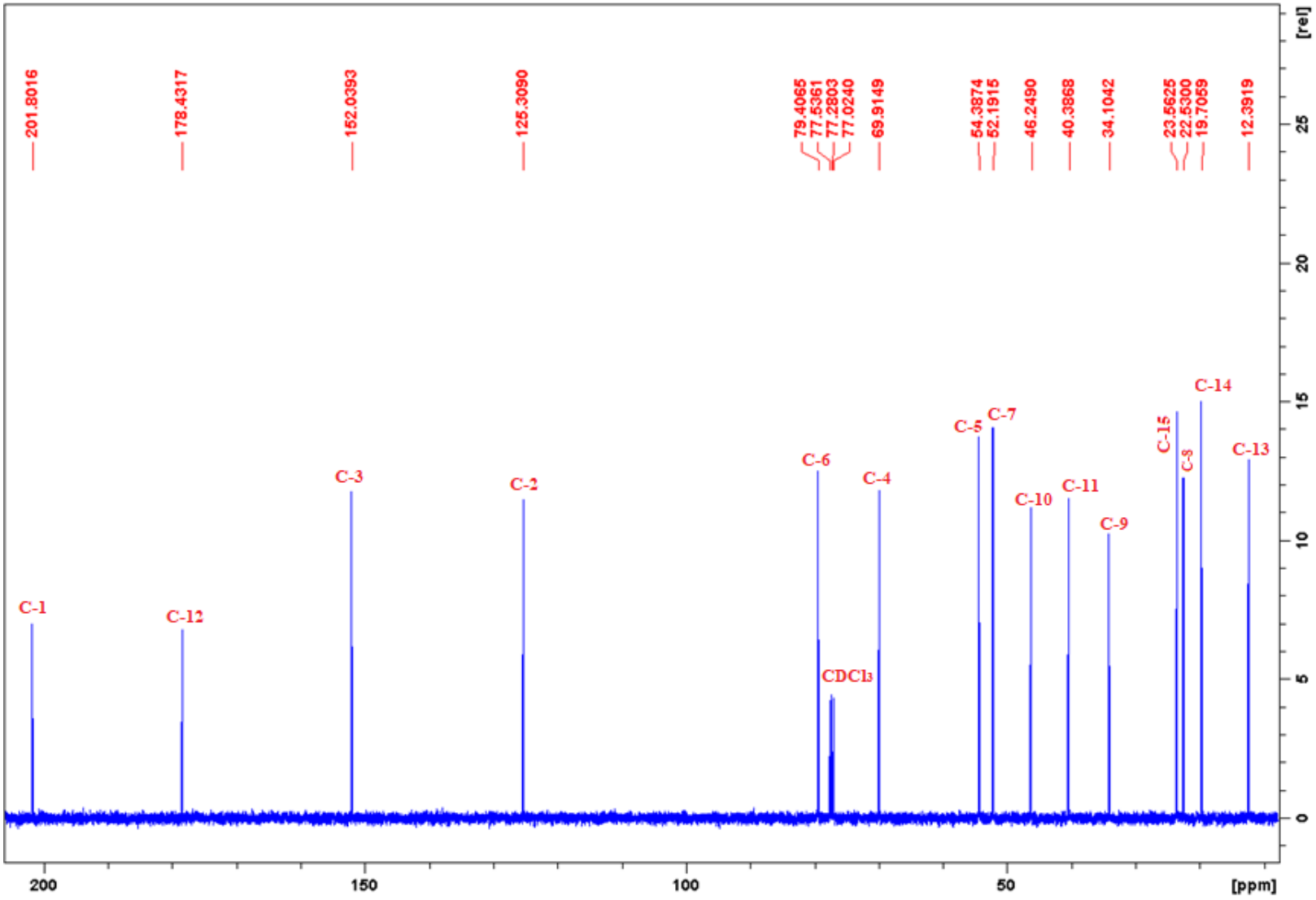

Figure S3: ^{13}C NMR data for VGN.

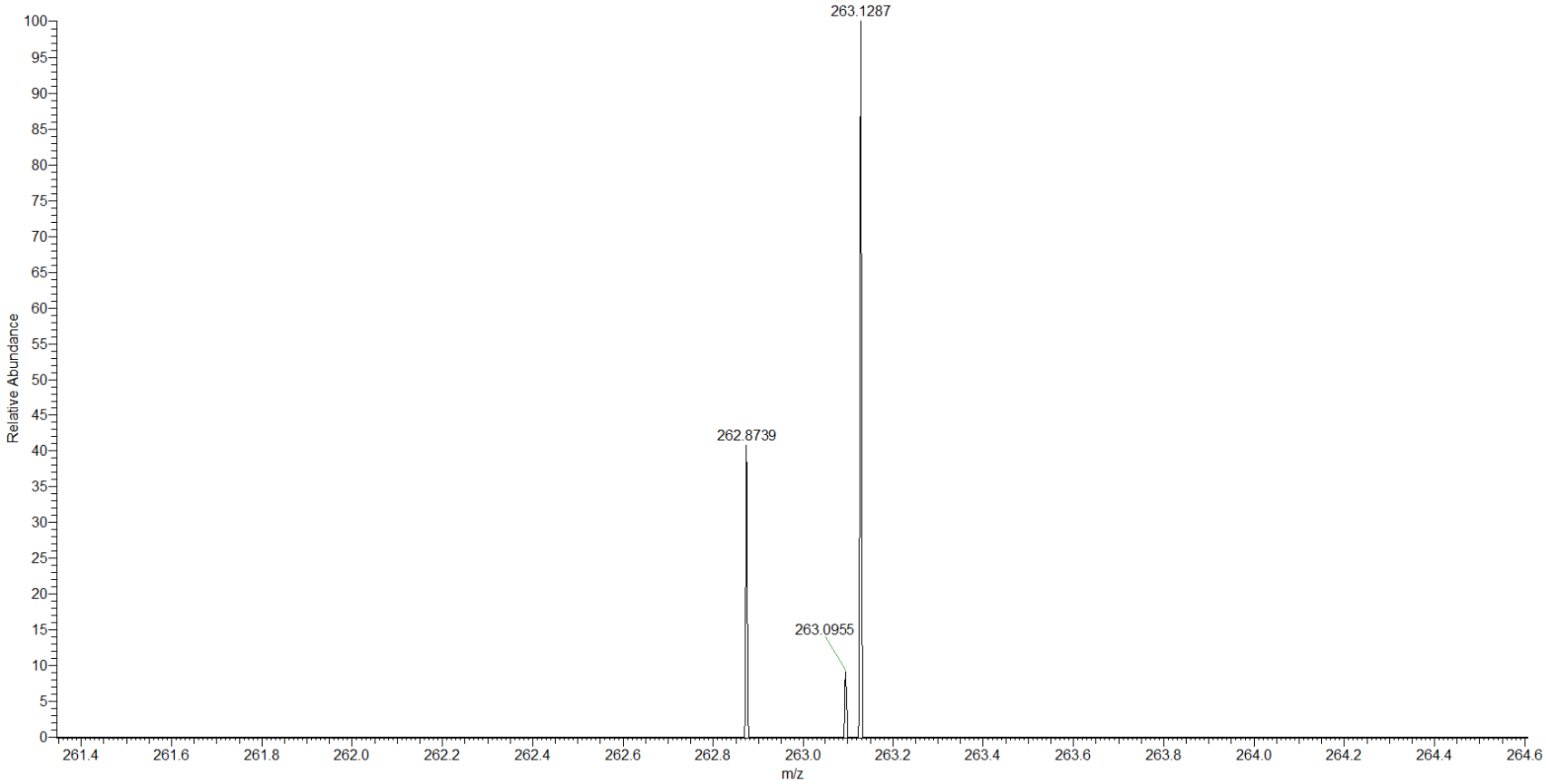

Figure S4: HRESIMS data of VGN (negative mode).

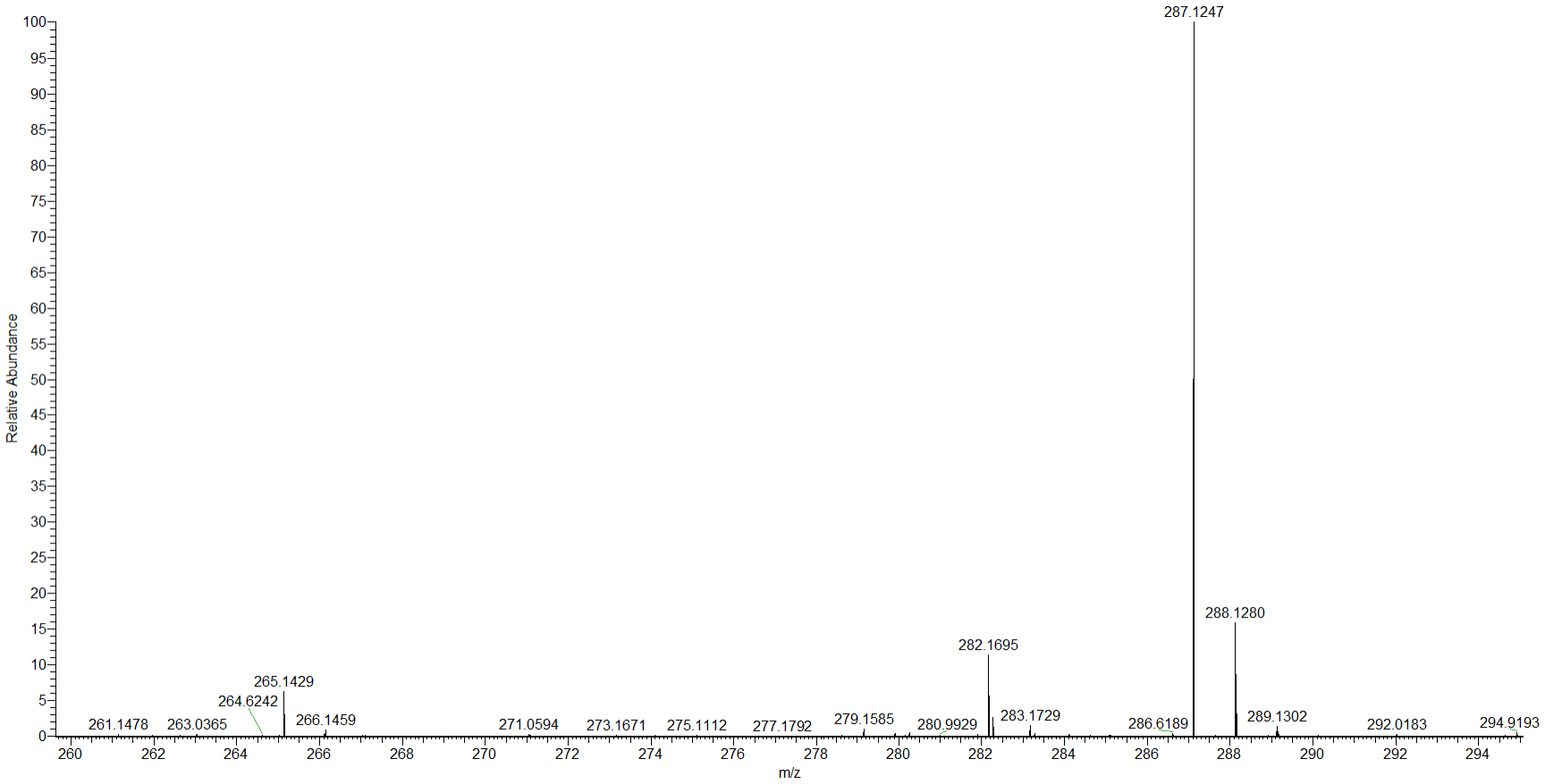

Figure S5: HRESIMS data of VGN (positive mode).

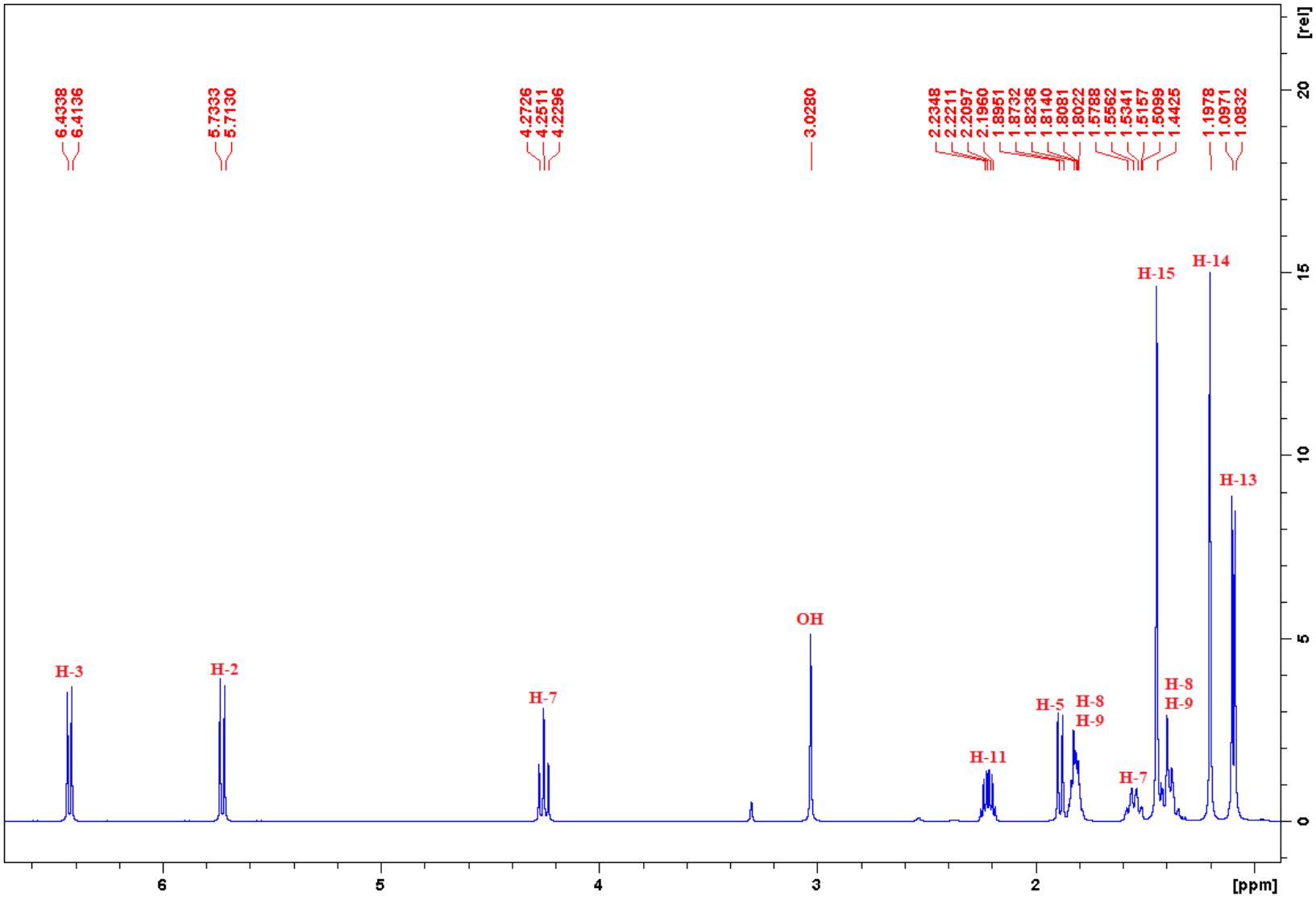

Figure S6: ^{1}H NMR data for eVGN.

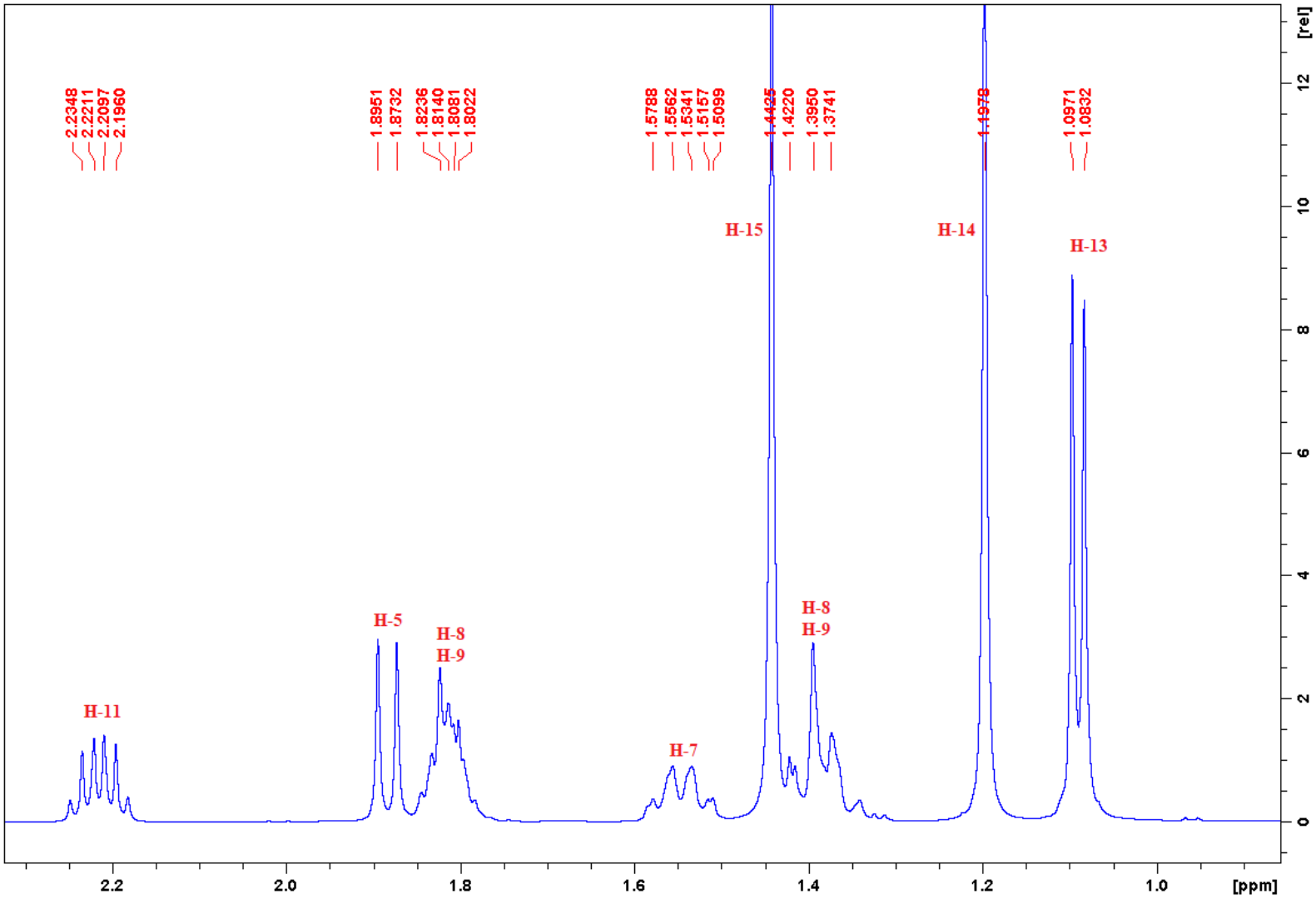

Figure S7: ^{1}H NMR data for eVGN (Exp.).

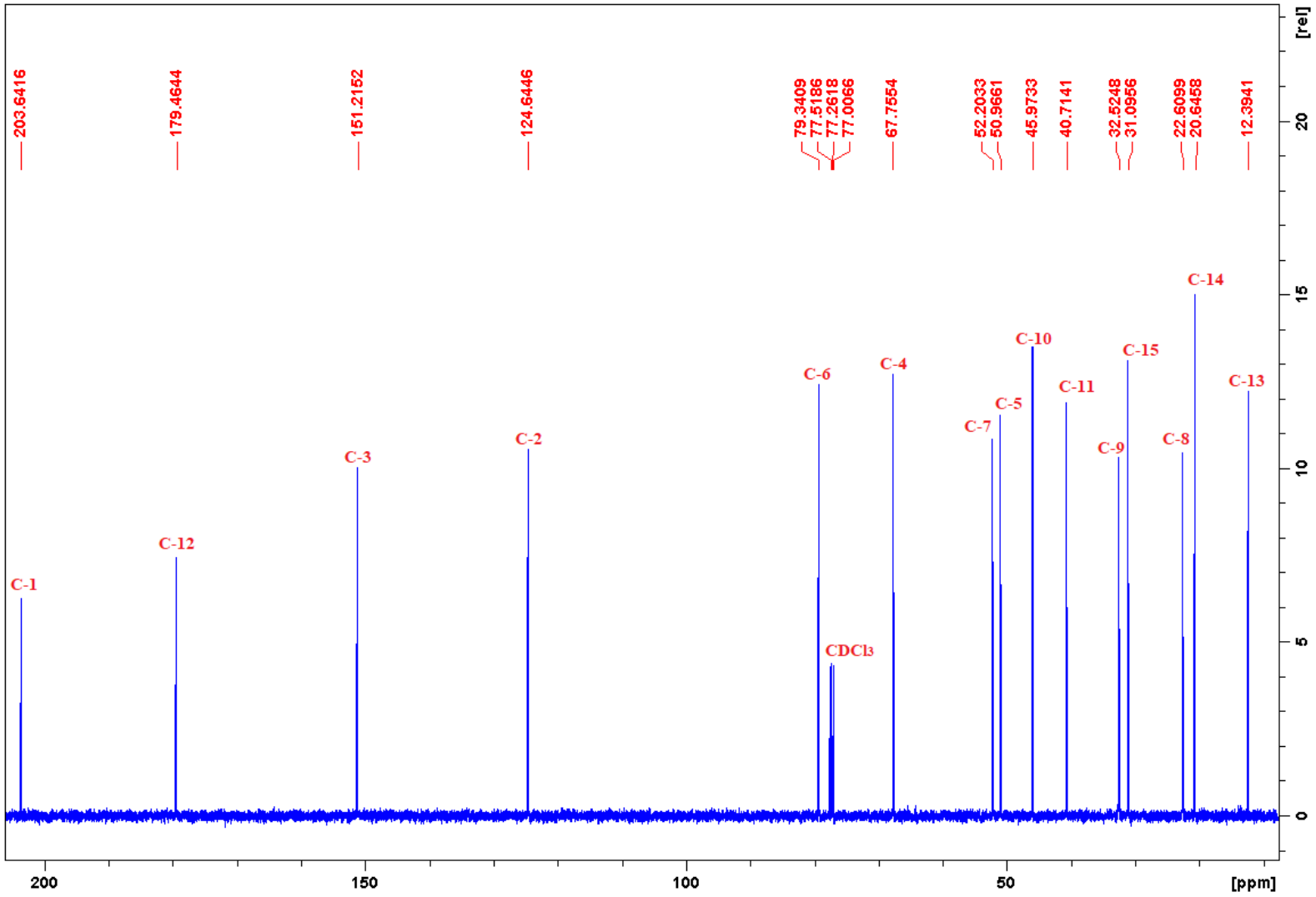

Figure S8: ^{13}C NMR data for eVGN.

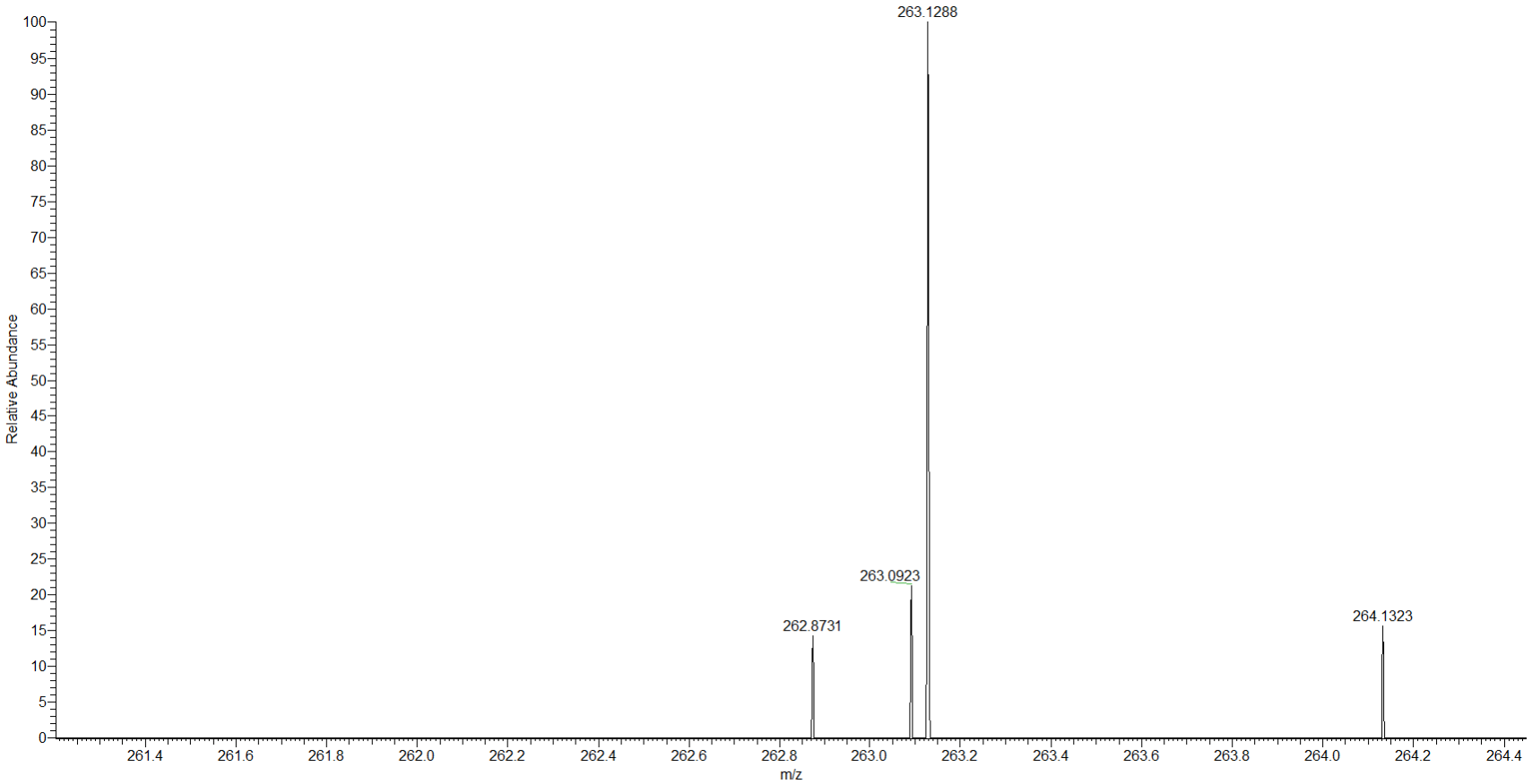

Figure S9: HRESIMS data of eVGN (negative mode).

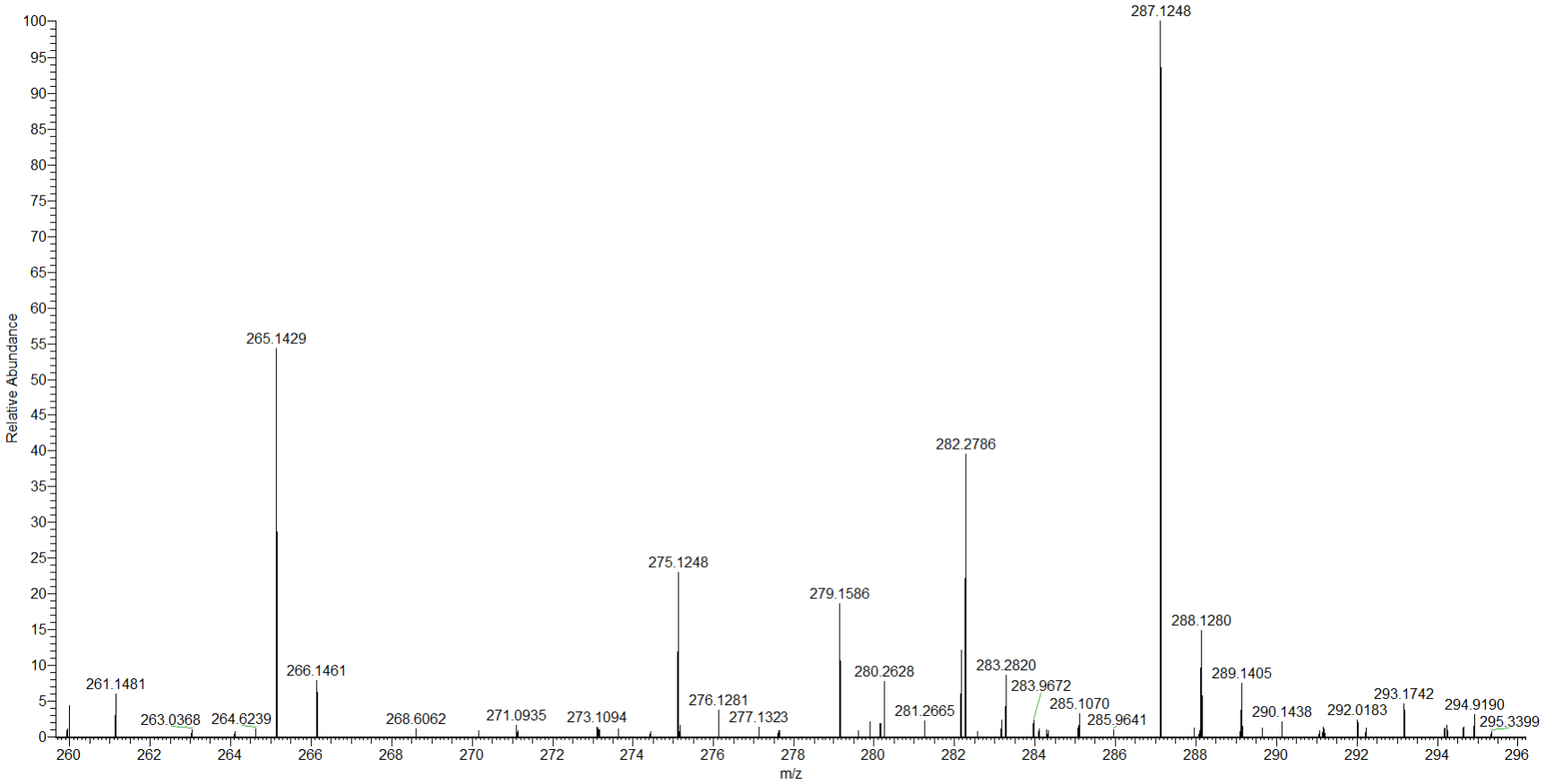

Figure S10: HRESIMS data of eVGN (positive mode).