Supplementary Information for

Article

Production of Highly Modified C_{30}-carotenoids with Singlet Oxygen-quenching Activities, 5-glucosyl-5,6-dihydro-4,4′-di-apolycopen-4′-oic Acid, and Its Three Intermediates Using Genes from *Planococcus maritimus* Strain iso-3

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Table S1. PCR primers used in this study.

Primer	Sequence
PpCrtPF	CGGATCCAGGAGGCAGCTATGGGCAAAGCGAAAAAATC
PpCrtPR	CGGTACCCAGATCTTAGTTGTTTTGGTTGTCGCGC
PpALDHF	CGGATCCAGGAGGCAGCTATGAATTTTACAGCCAACG
PpALDHR	CGGTACCCAGATCTTATTTCAATACTGTCCGGACCC

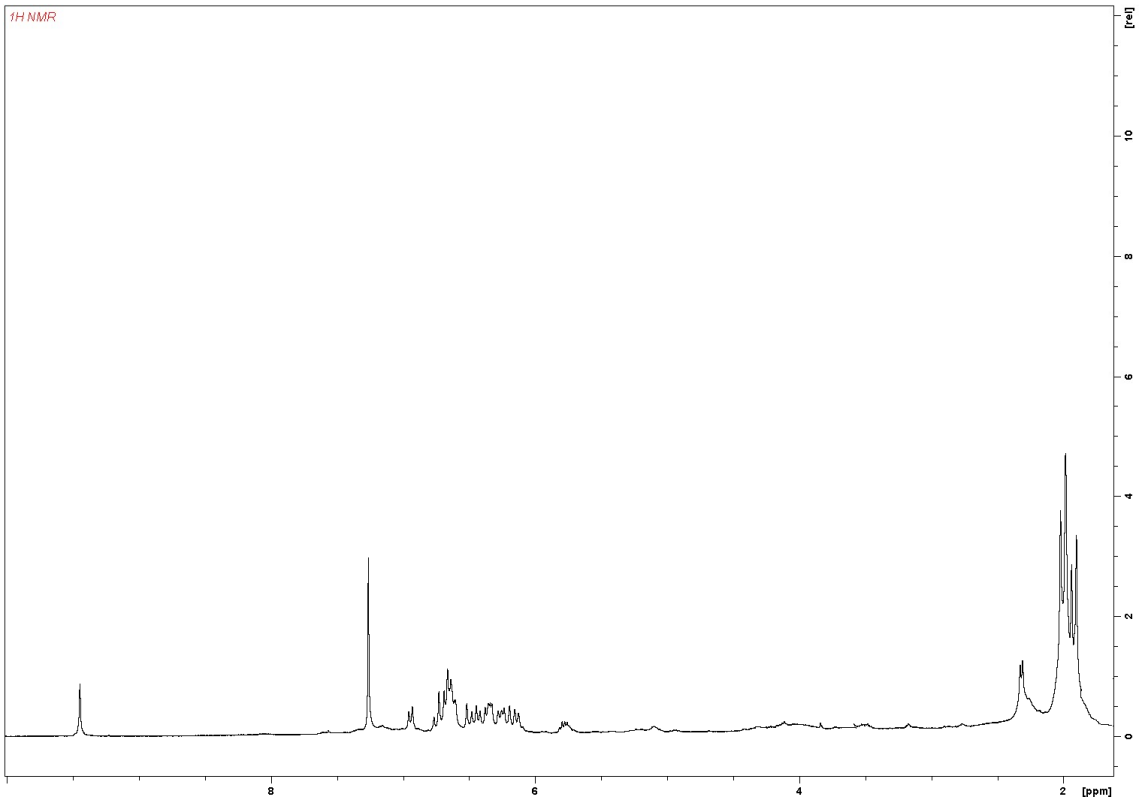

Figure S1. ^{1}H NMR spectrum of 5-hydroy-5,6-dihydro-diapo-4,4′-lycope-4′-al (**1**) in $CDCl_3$.

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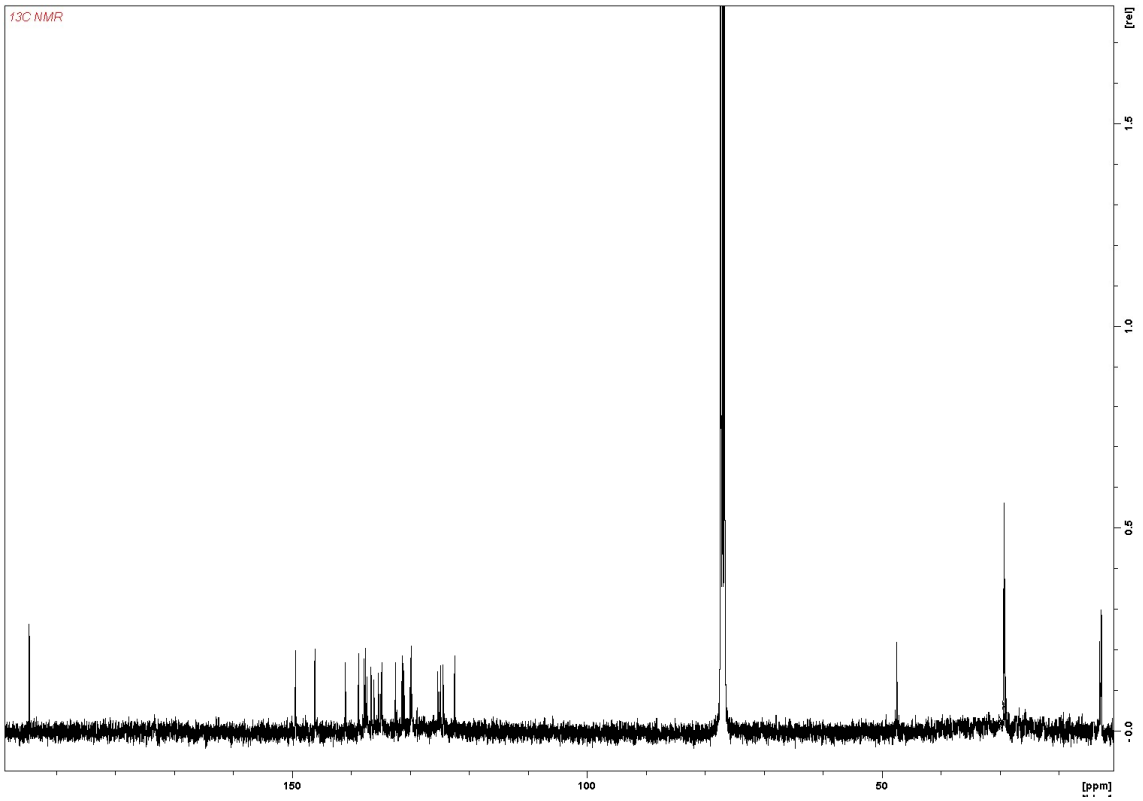

Figure S2. ^{13}C NMR spectrum of 5-hydroy-5,6-dihydro-diapo-4,4′-lycope-4′-al (**1**) in $CDCl_3$.

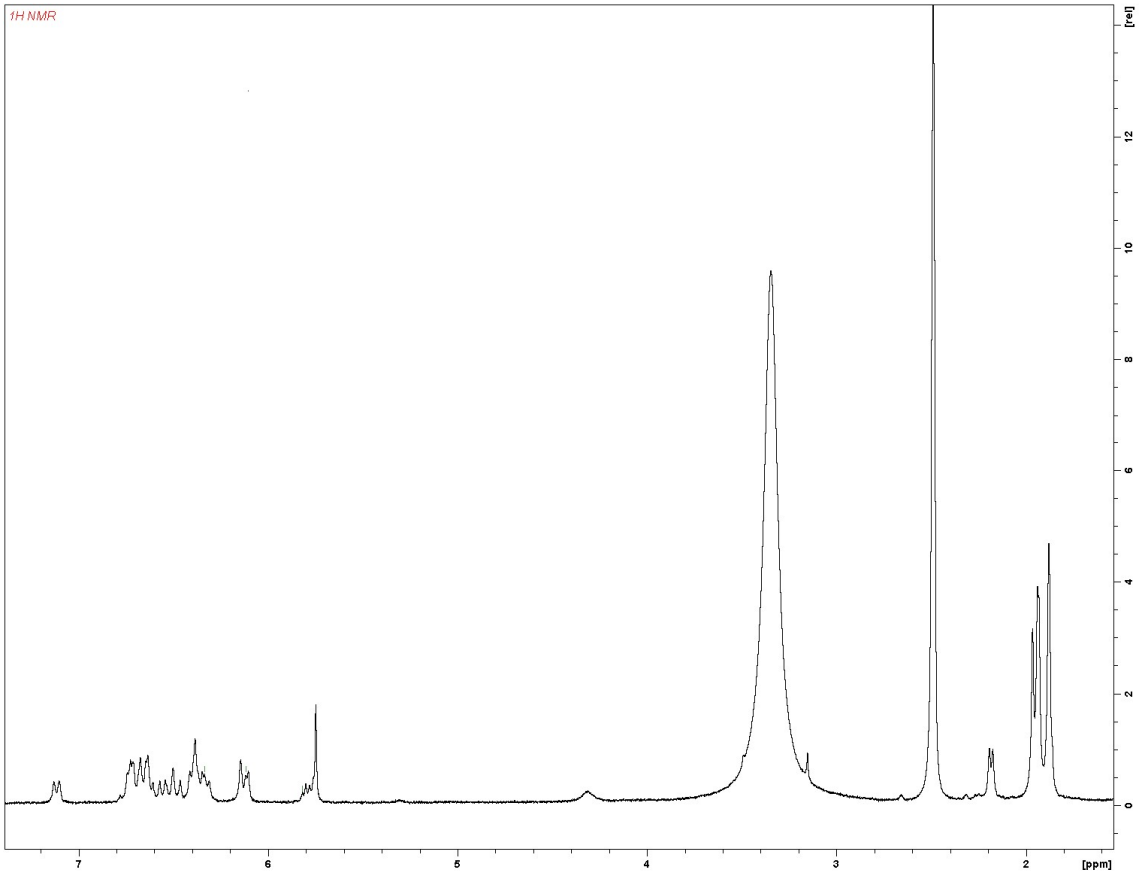

Figure S3. ^{1}H NMR spectrum of 5-hydroy-5,6-dihydro-diapo-4,4′-lycope-4′-oic acid (**2**) in DMSO-d_6.

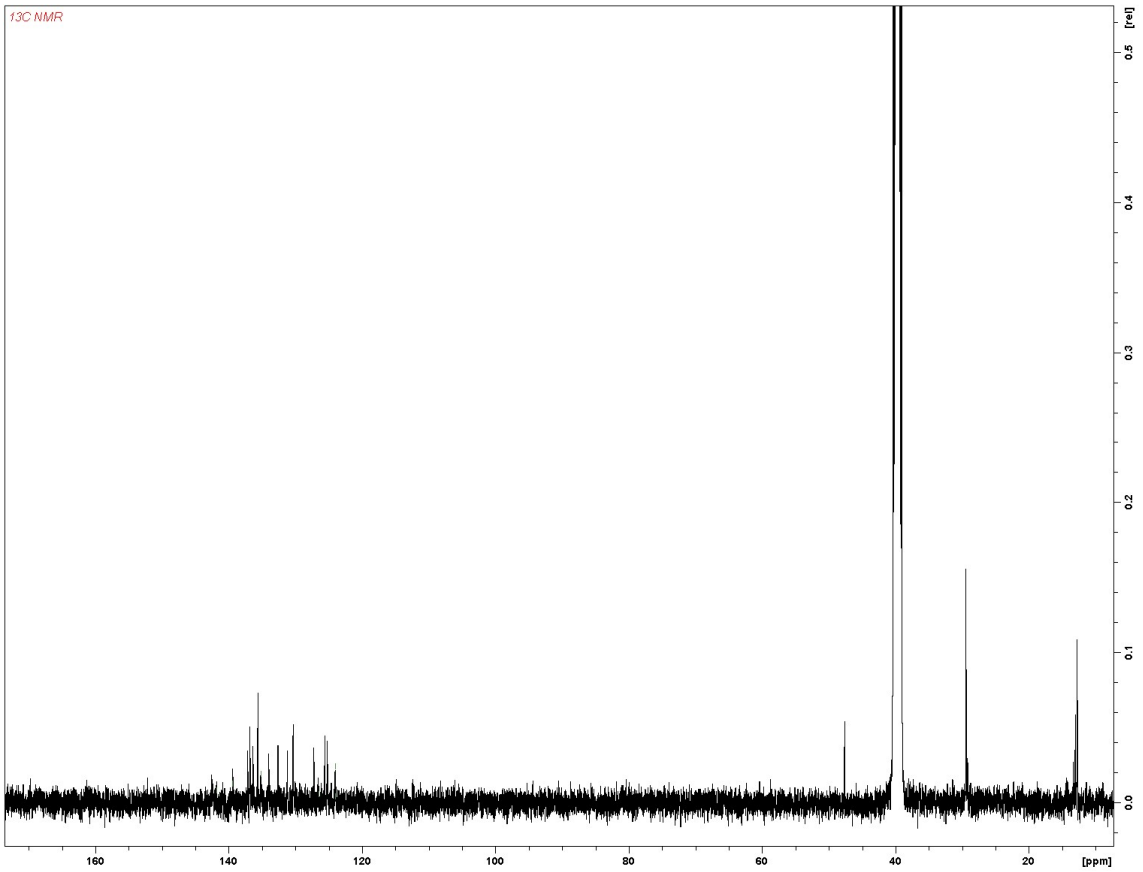

Figure S4. ^{13}C NMR spectrum of 5-hydroy-5,6-dihydro-diapo-4,4′-lycope-4′-oic acid (**2**) in DMSO-d_6.

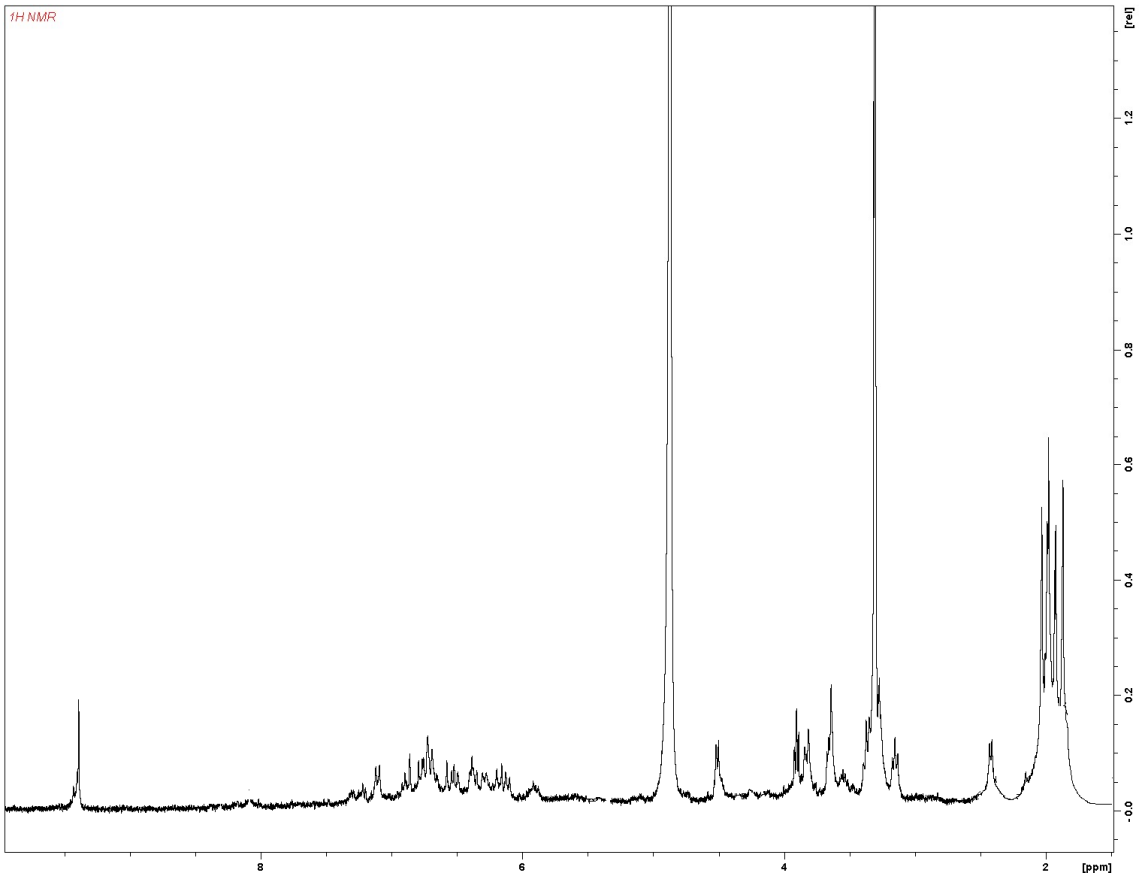

Figure S5. ^{1}H NMR spectrum of 5-glucosyl-5,6-dihydro-diapo-4,4′-lycope-4′-al (**3**) in CD_3OD.

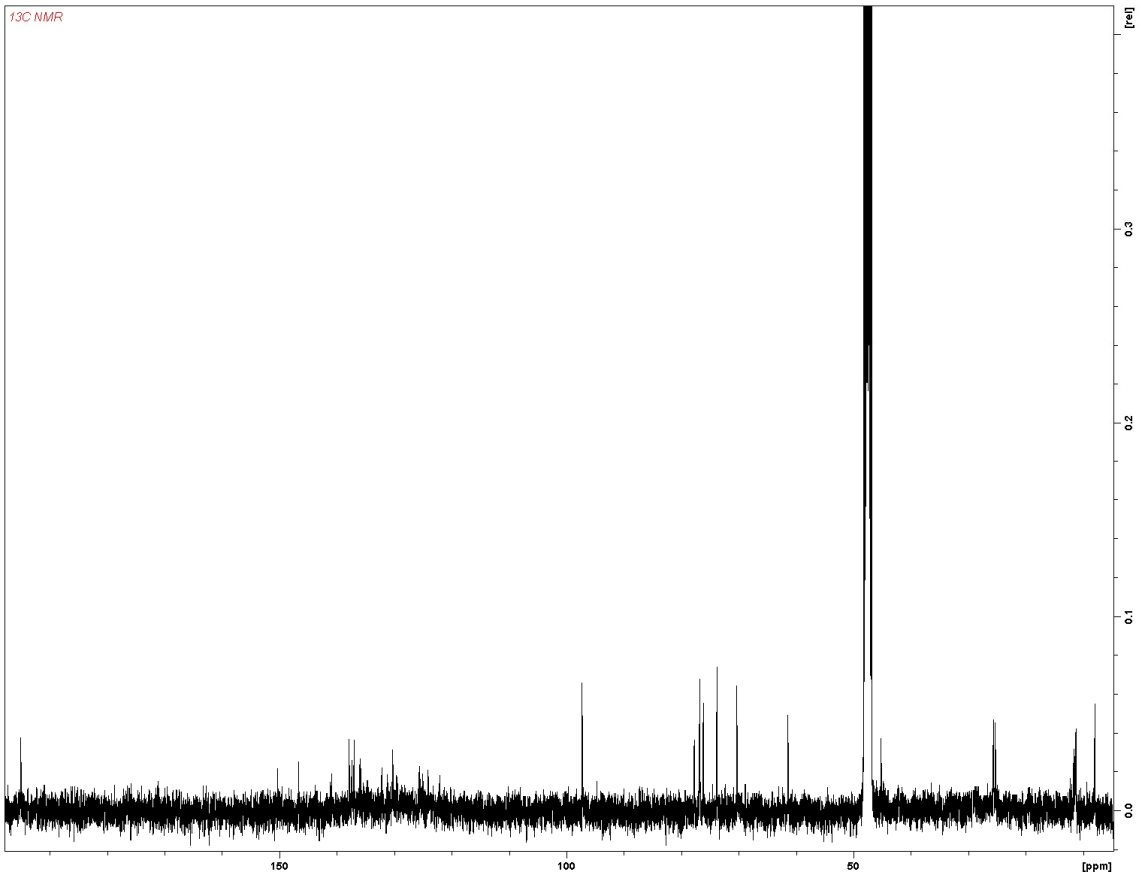

Figure S6. ^{13}C NMR spectrum of 5-glucosyl-5,6-dihydro-diapo-4,4′-lycope-4′-al (**3**) in CD_3OD.

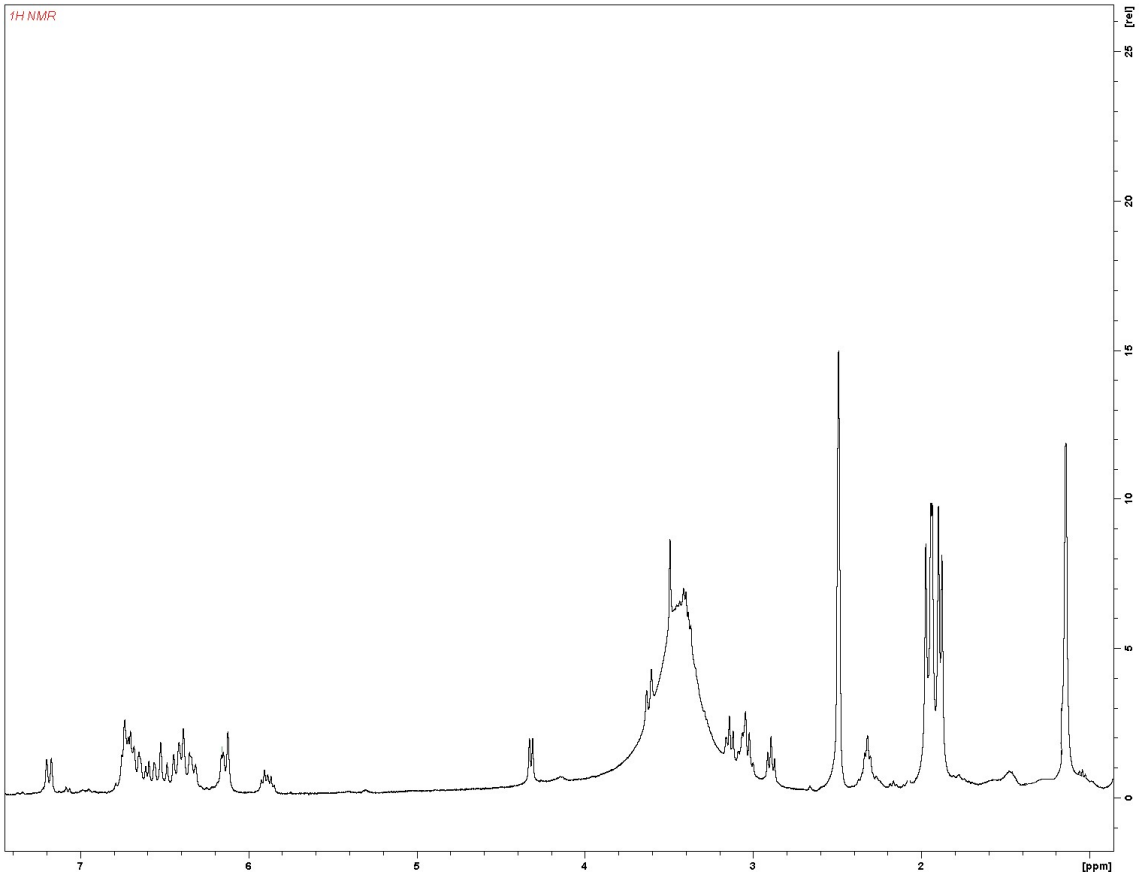

Figure S7. ^{1}H NMR spectrum of 5-glucosyl-5,6-dihydro-diapo-4,4′-lycope-4′-oic acid (**4**) in DMSO-d_6.

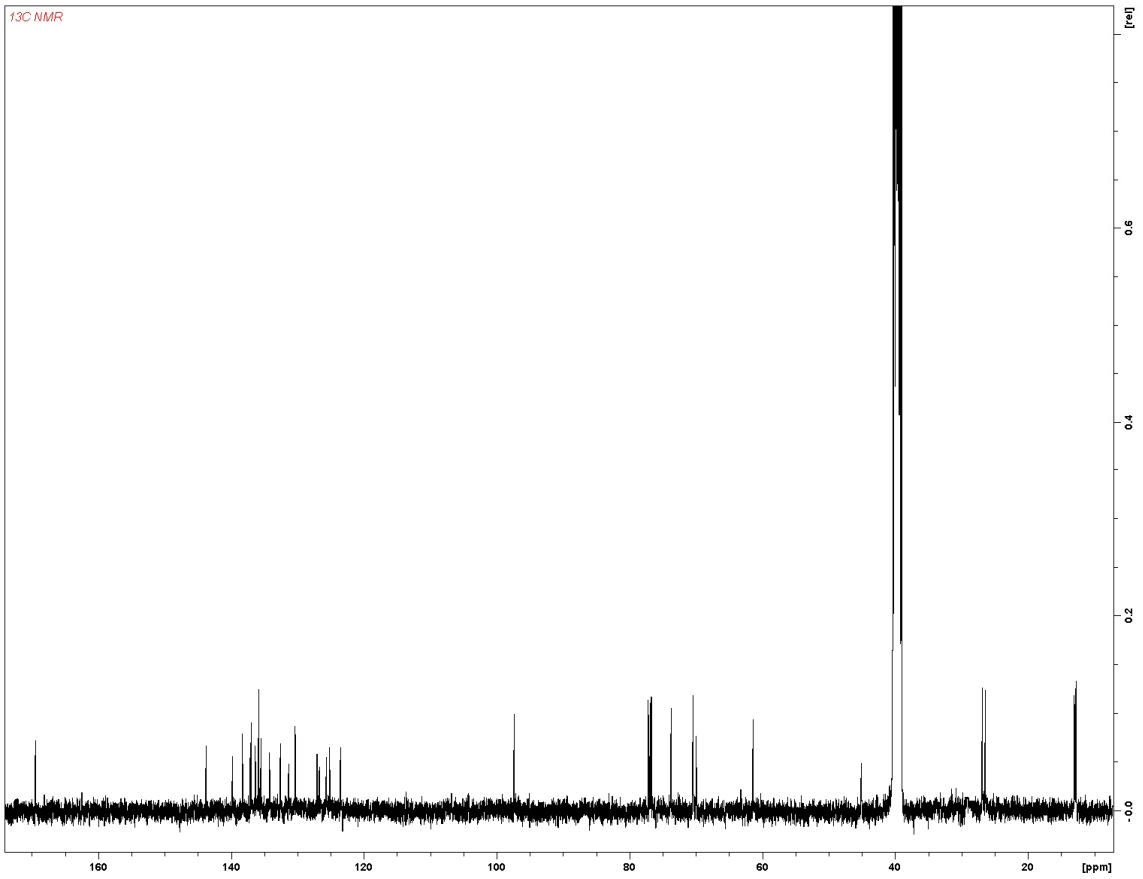

Figure S8. ^{13}C NMR spectrum of 5-glucosyl-5,6-dihydro-diapo-4,4′-lycope-4′-oic acid (**4**) in DMSO-d_6.