

Supplementary Information

Associated Article: Four saponins isolated from the aerial parts of *Allium jesdianum* exhibit antimicrobial effects against clinical strains resistant to Colistin, with in silico study

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Table S1. The list of primers sequences for real-time PCR

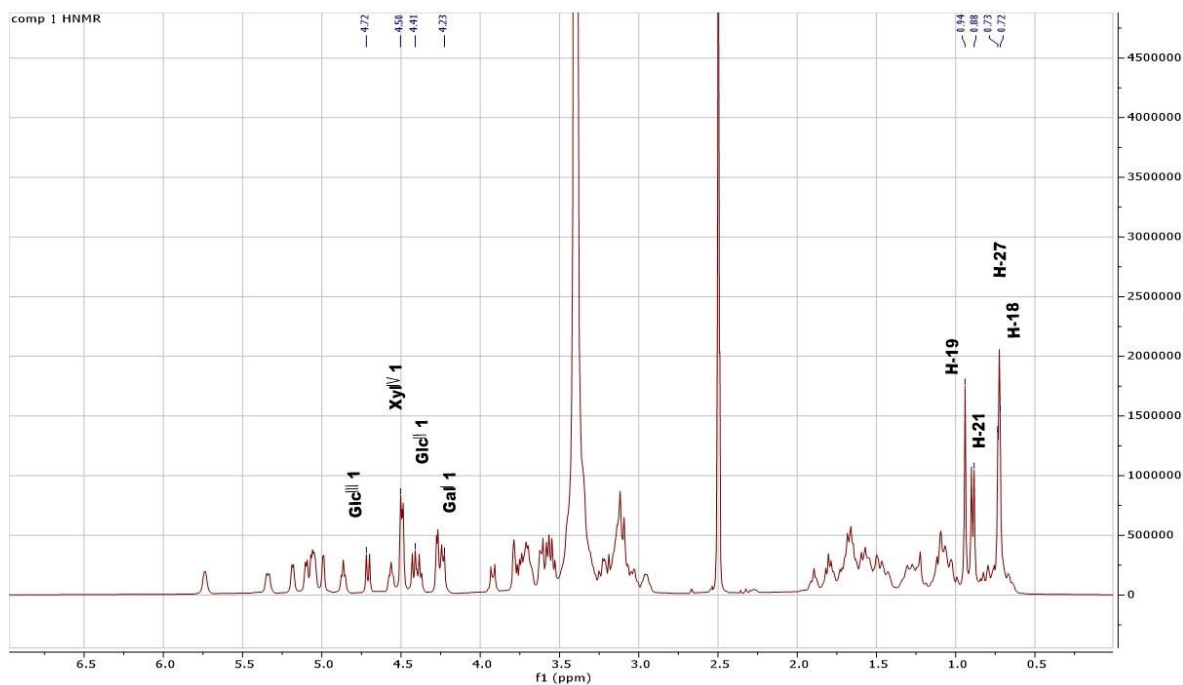


Figure S1. ^1H NMR (400 MHz, DMSO-d_6) spectrum of compound 1.

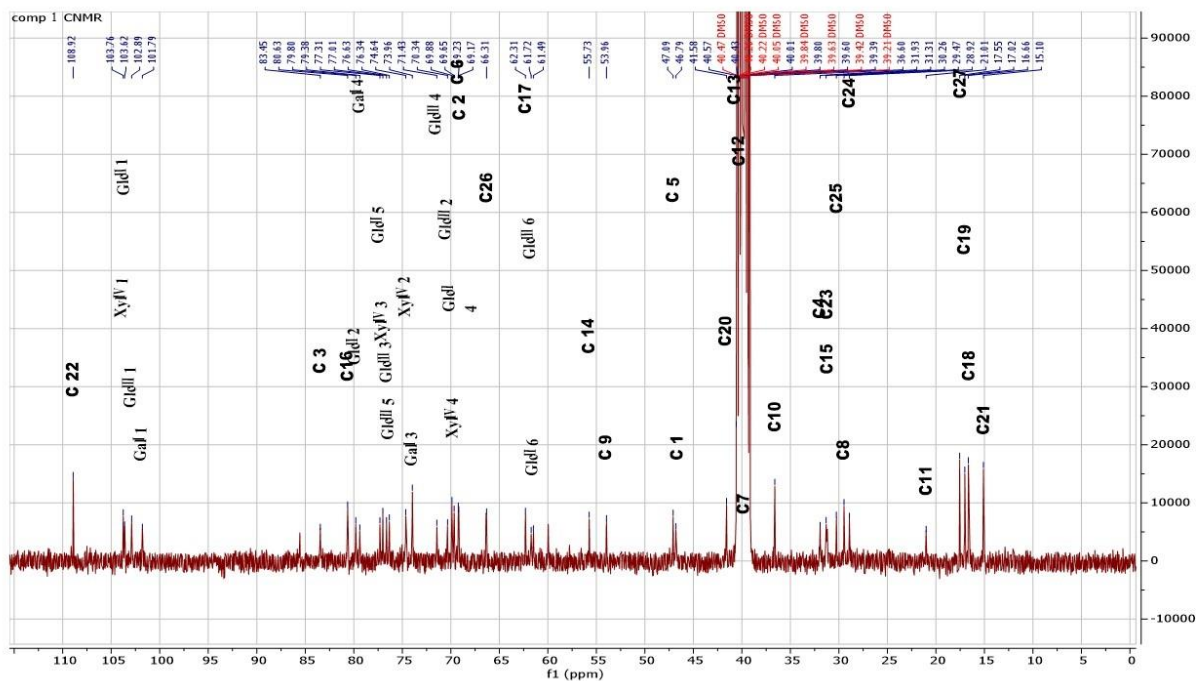


Figure S2. ^{13}C NMR (100 MHz, DMSO-d_6) spectrum of compound 1.

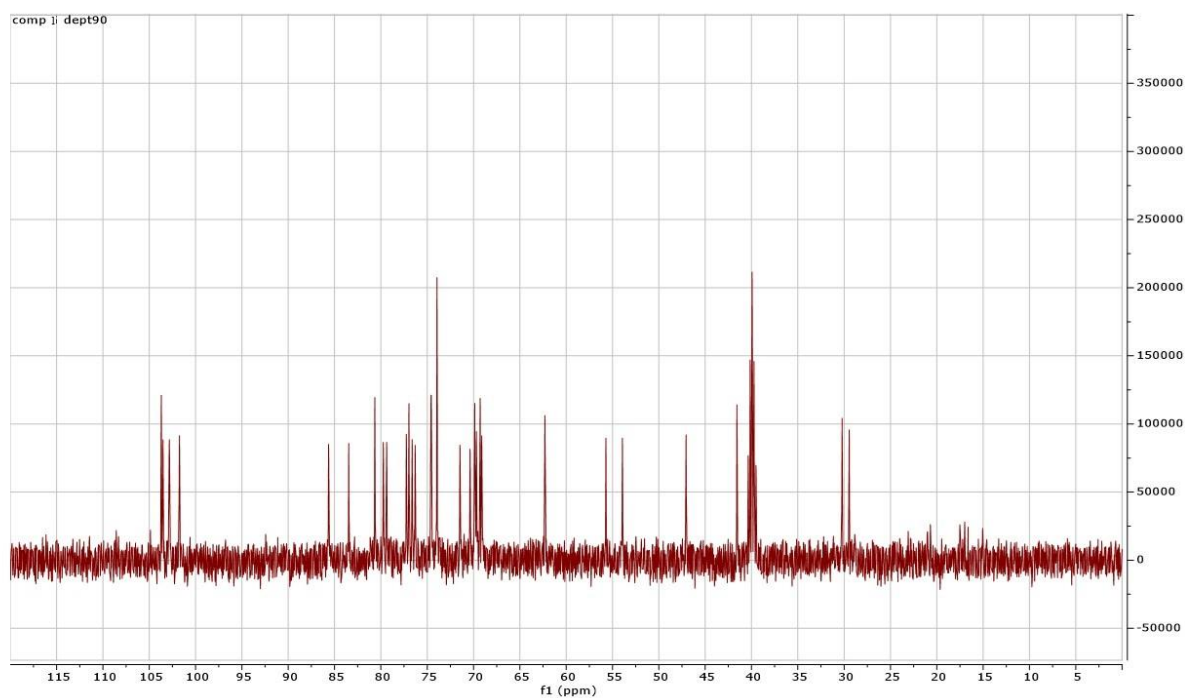


Figure S3. DEPT-90 spectrum of compound 1.

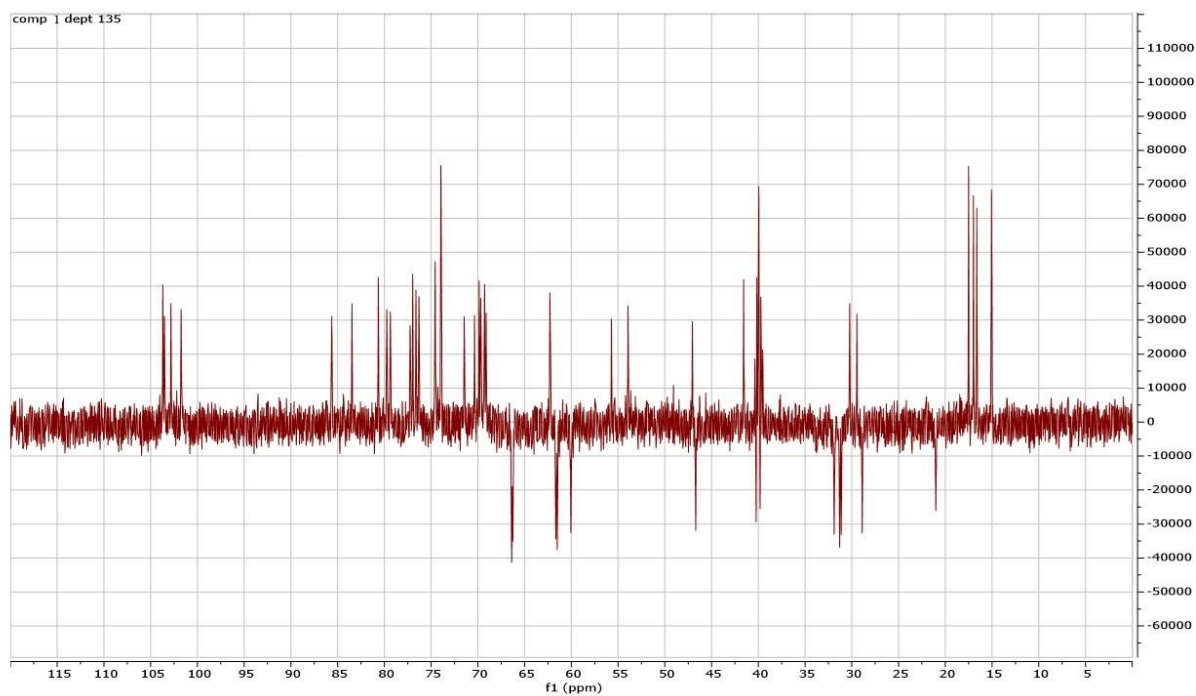


Figure S4. DEPT-135 spectrum of compound 1.

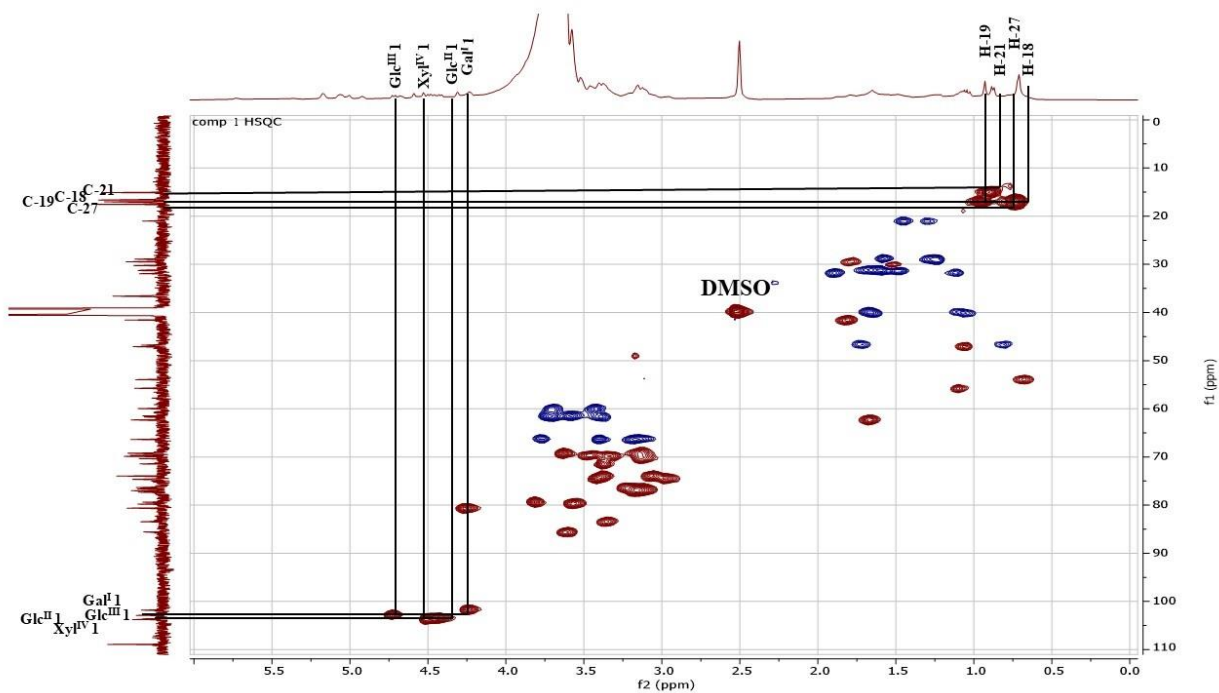


Figure S5. HSQC spectrum of compound 1.

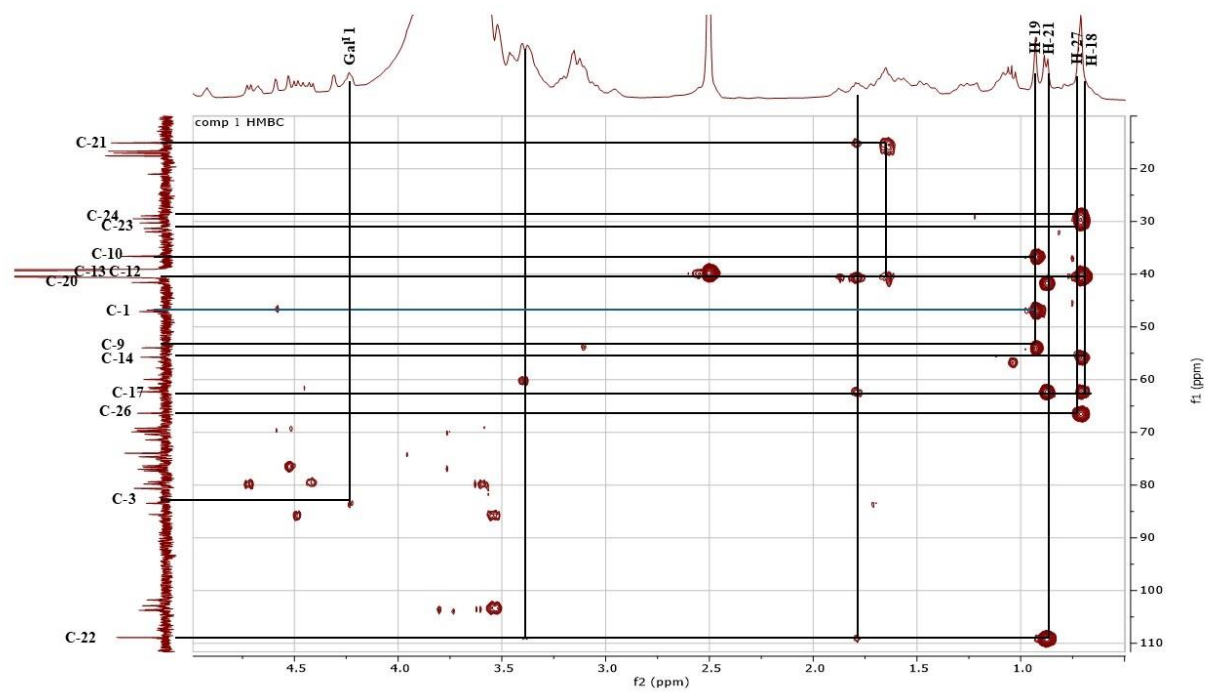


Figure S6. HMBC spectrum of compound 1.

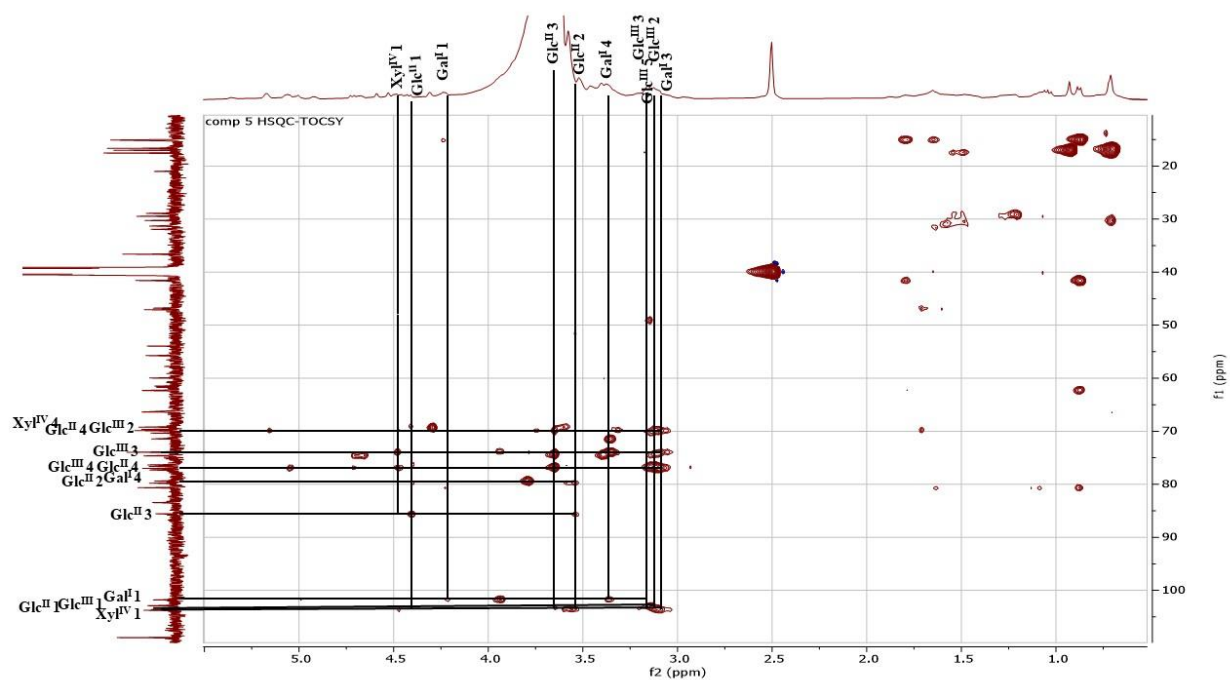


Figure S7. HSQC-TOCSY spectrum of compound 1.

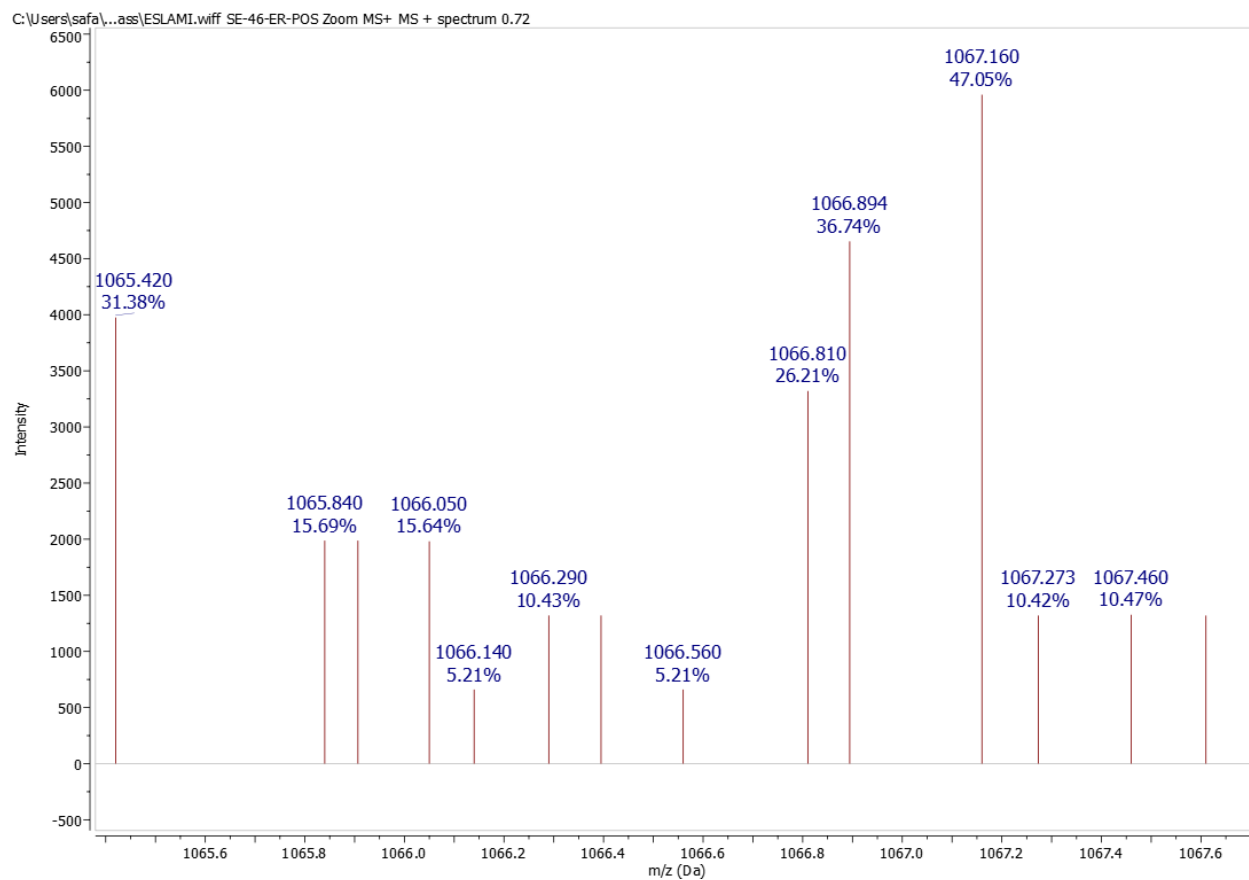


Figure S8. Positive ESI Mass spectrum of compound 1

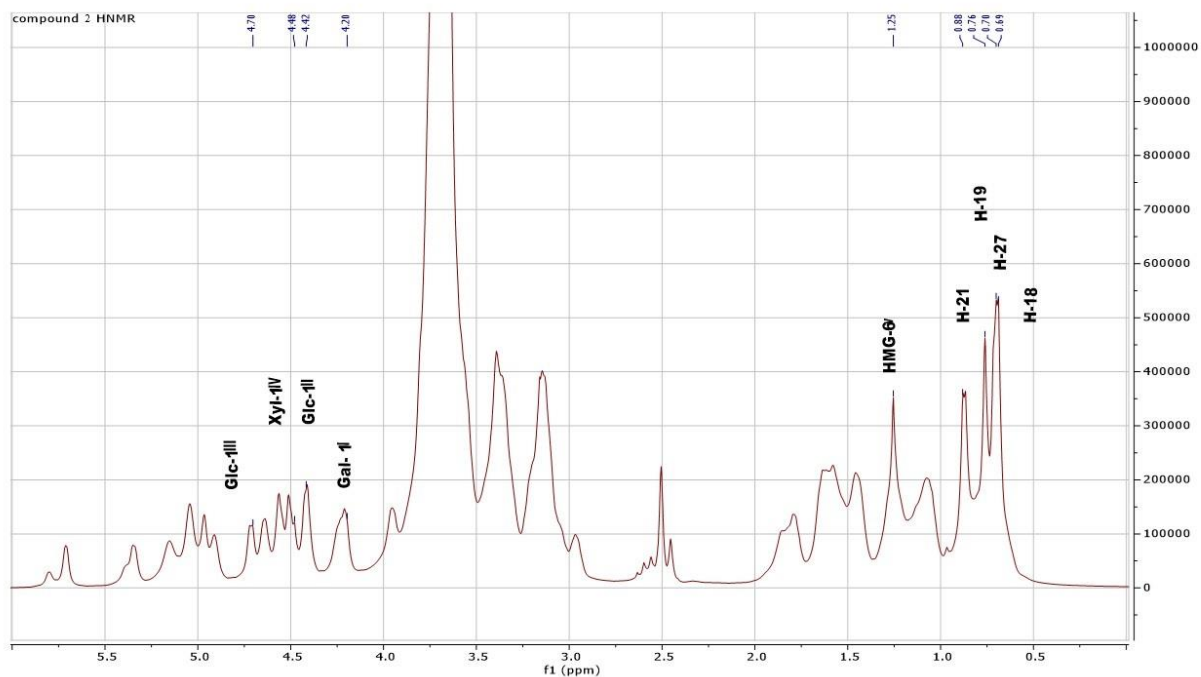


Figure S9. ^1H -NMR (400 MHz, DMSO-d_6) spectrum of compound 2.

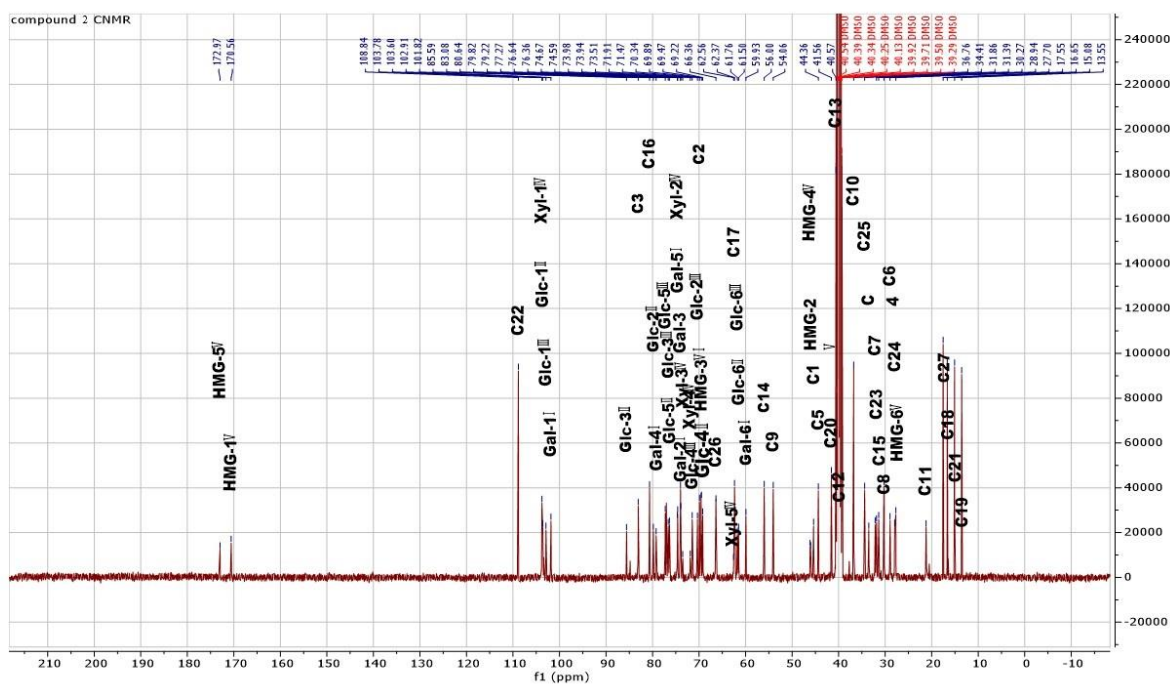


Figure S10. ^{13}C -NMR (100 MHz, DMSO-d_6) spectrum of compound 2.

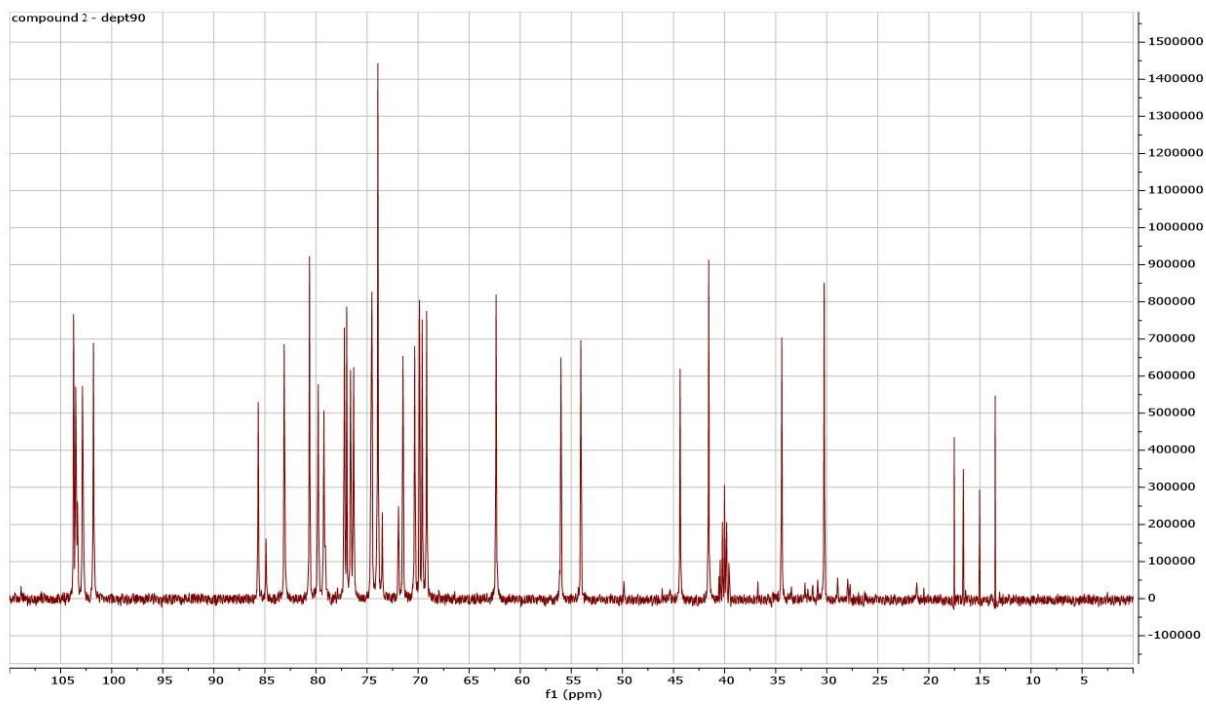


Figure S11. DEPT-90 spectrum of compound 2.

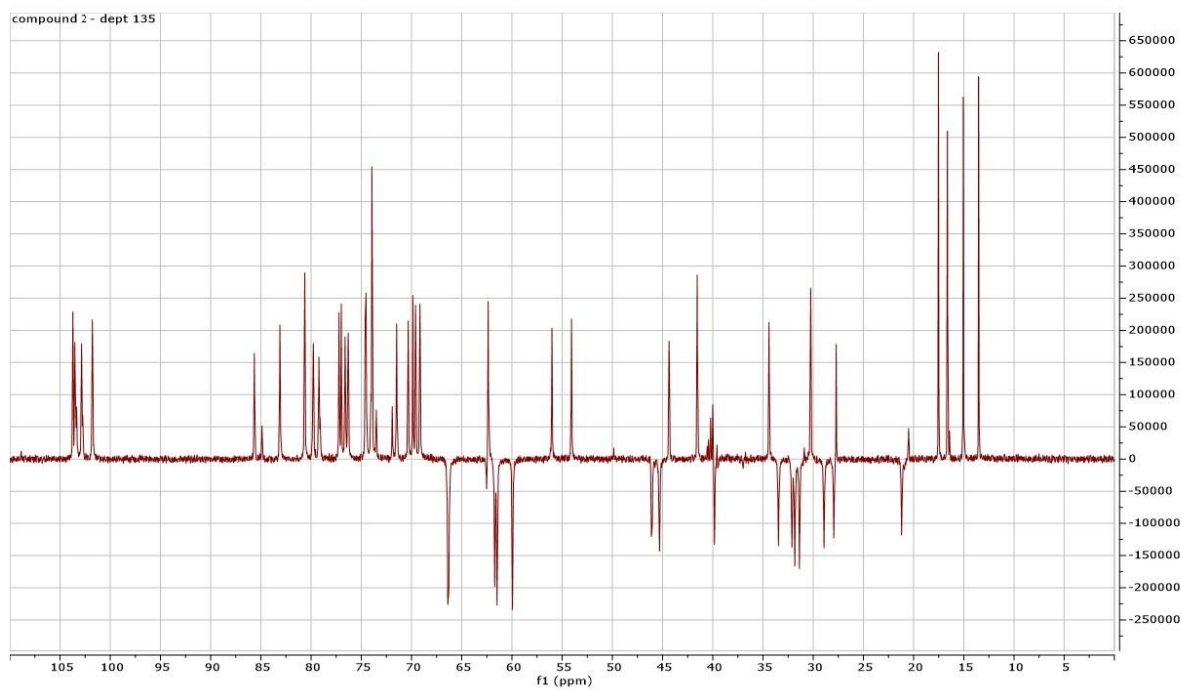


Figure S12. DEPT-135 spectrum of compound 2.

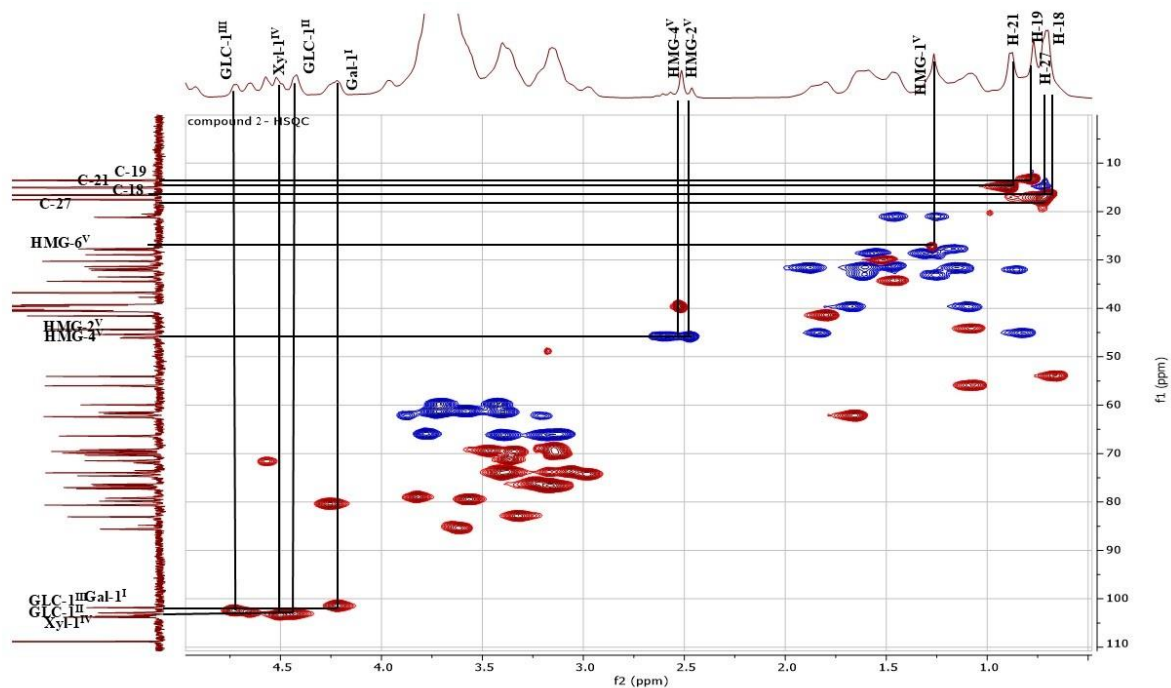


Figure S13. HSQC spectrum of compound 2.

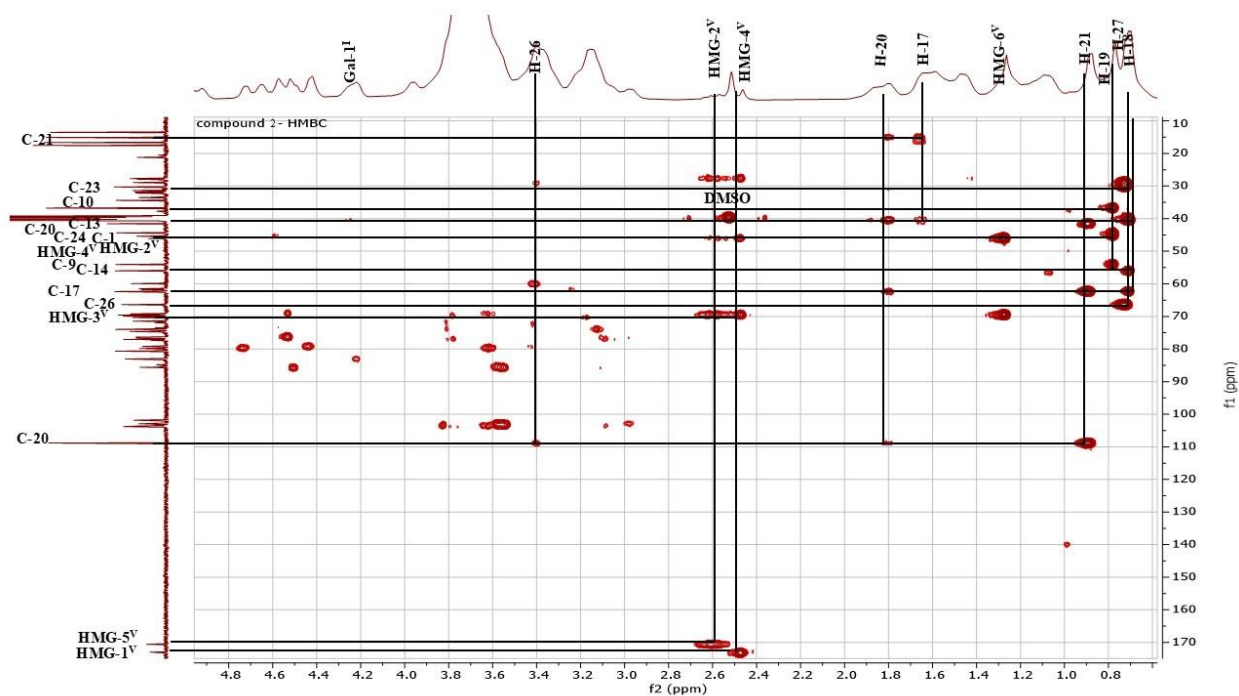


Figure S14. HMBC spectrum of compound 2.

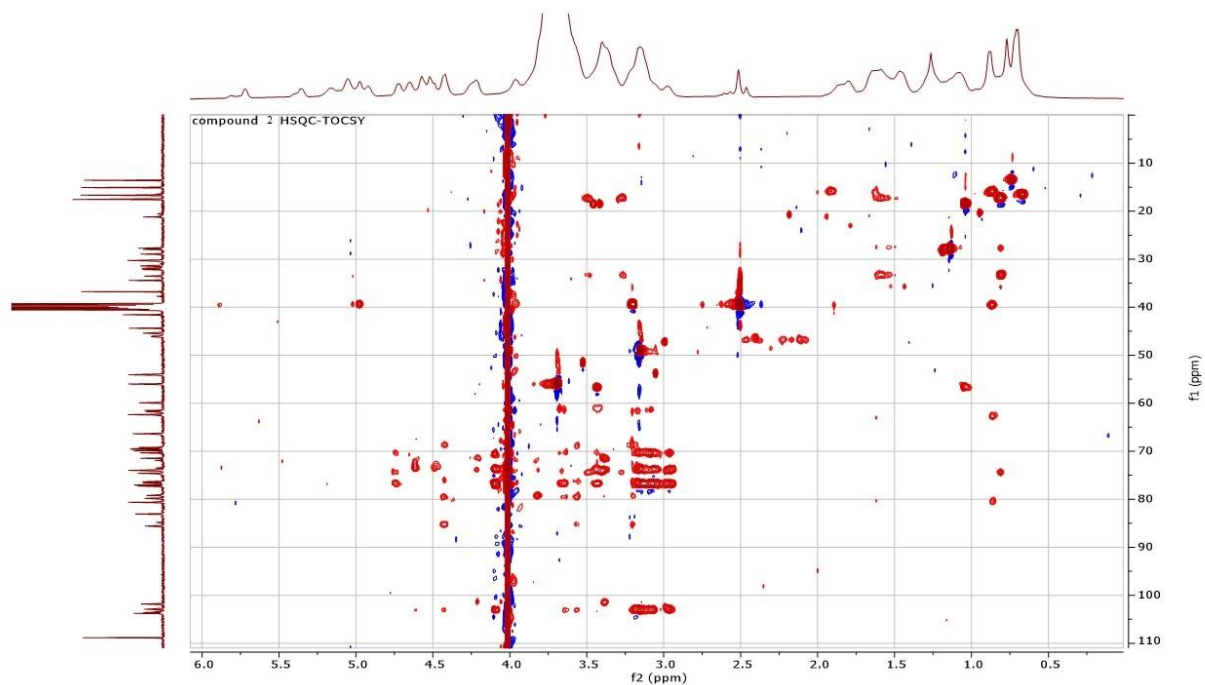


Figure S15. HSQC-TOCSY spectrum of compound 2.

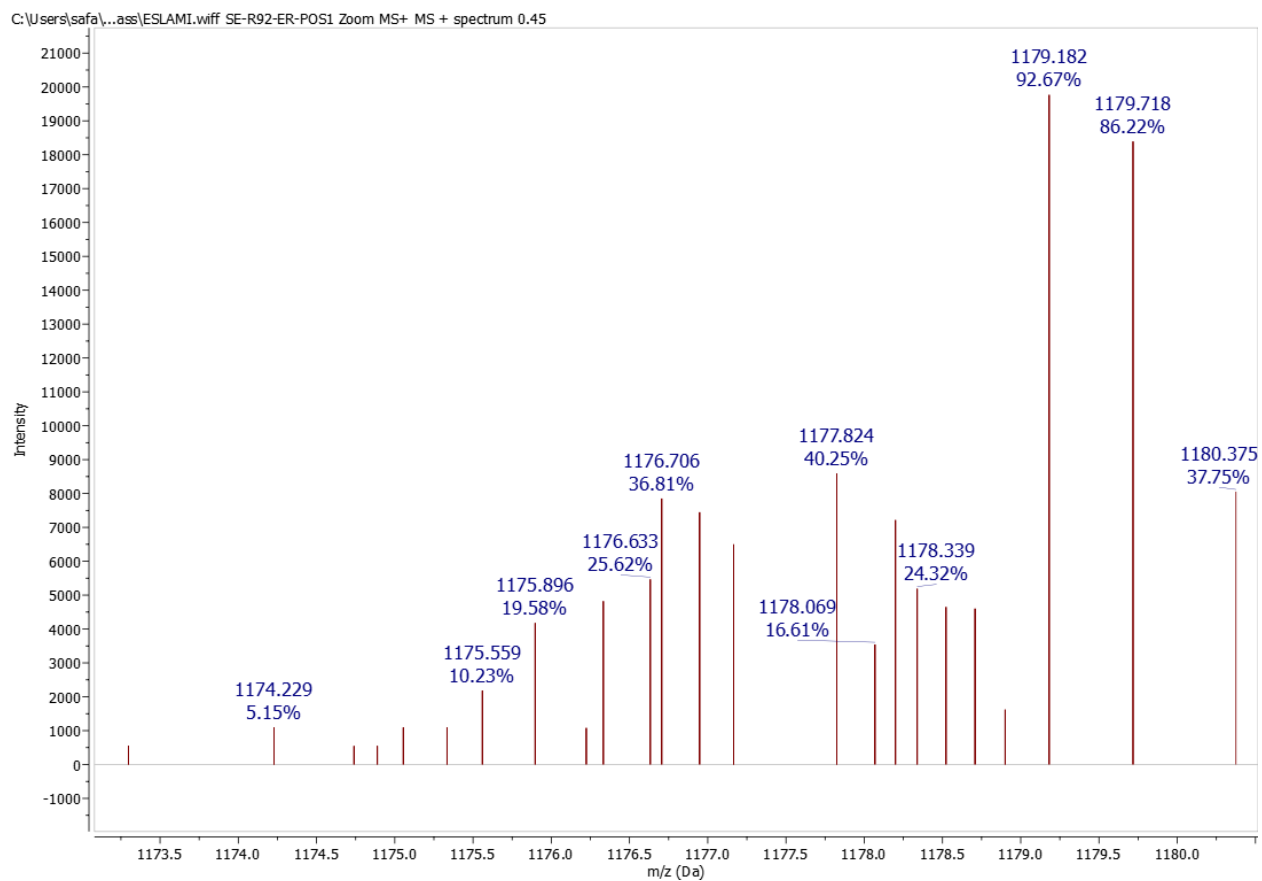


Figure S16. Positive ESI Mass spectrum of compound 2

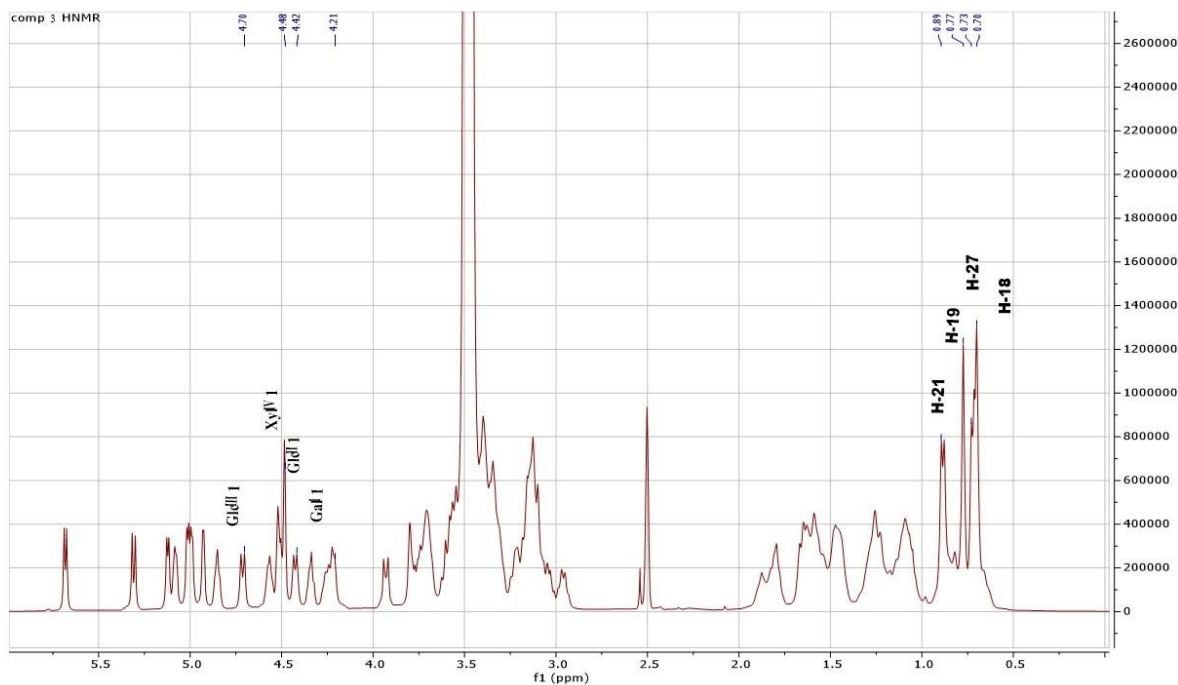


Figure S17. ^1H NMR (400 MHz, DMSO-d_6) spectrum of compound 3.

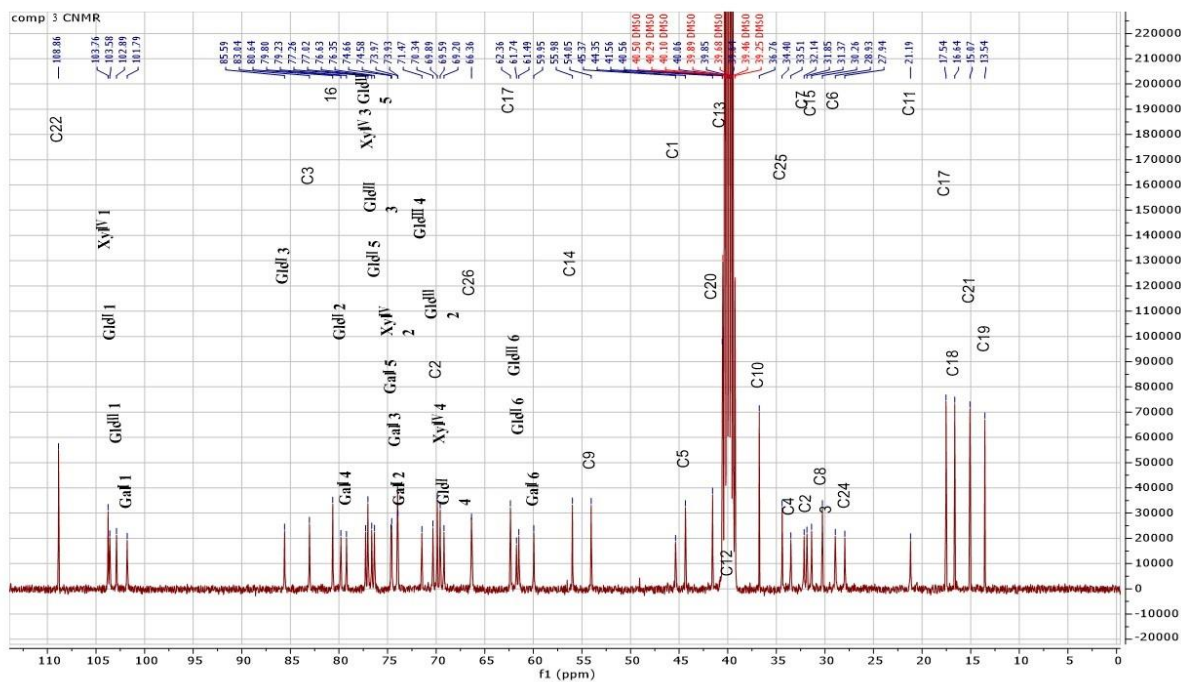


Figure S18. ^{13}C NMR (100 MHz, DMSO-d_6) spectrum of compound 3.

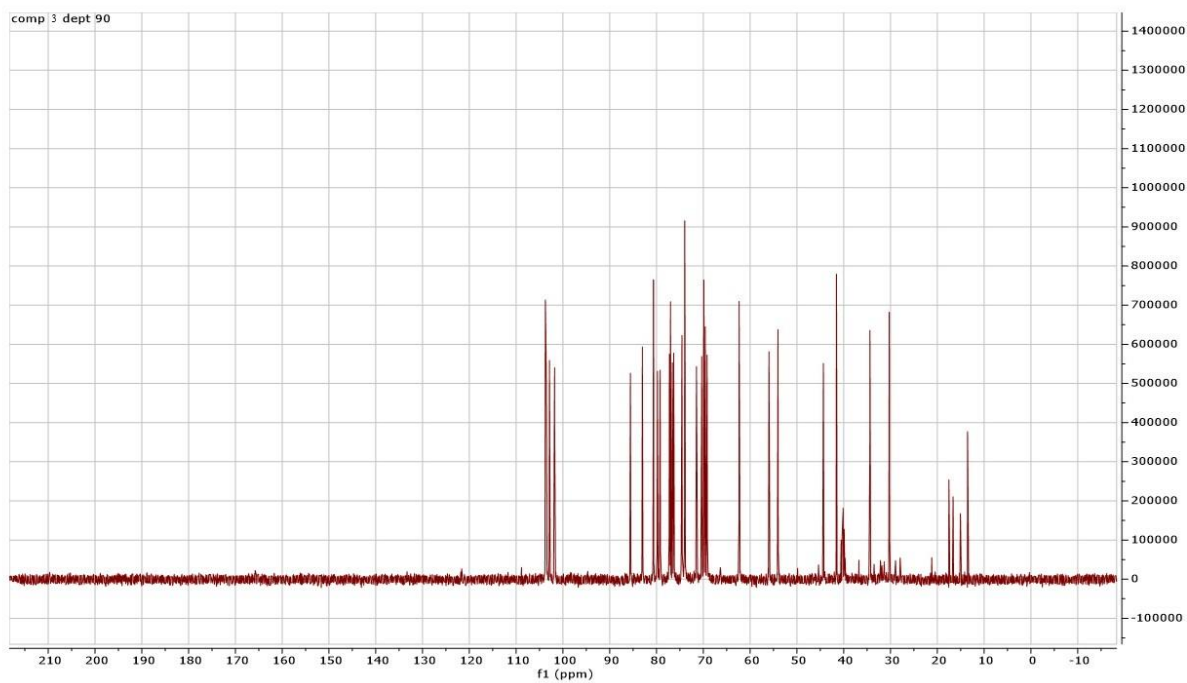


Figure S19. DEPT-90 spectrum of compound 3.

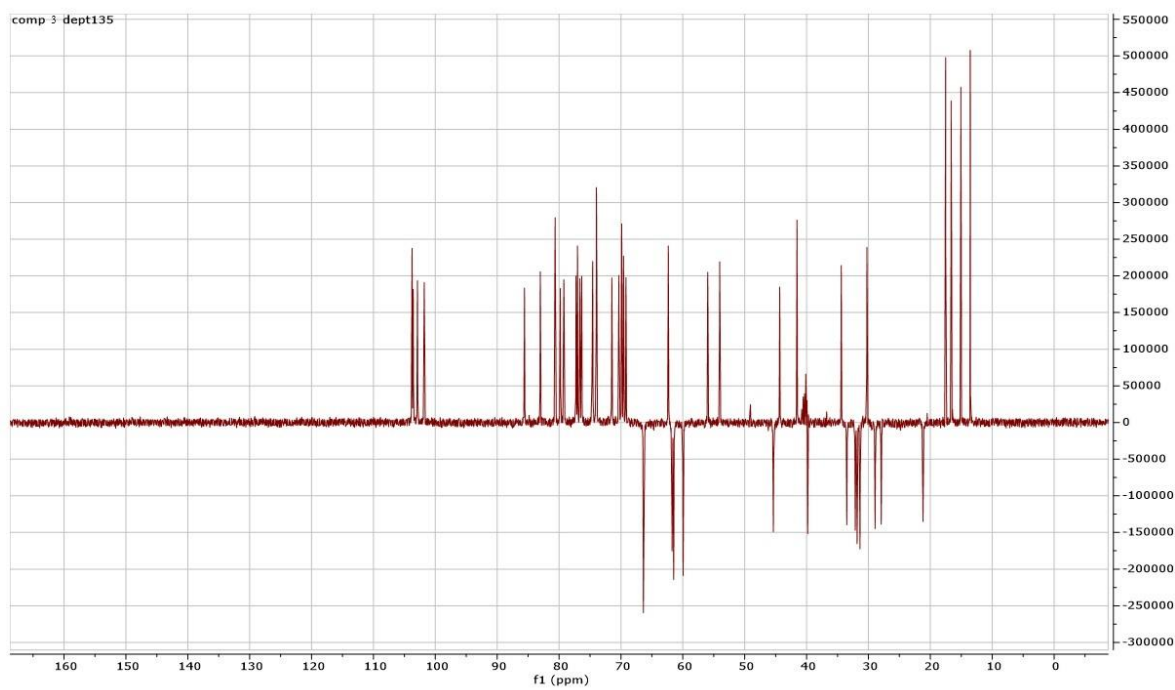


Figure S20. DEPT-135 spectrum of compound 3.

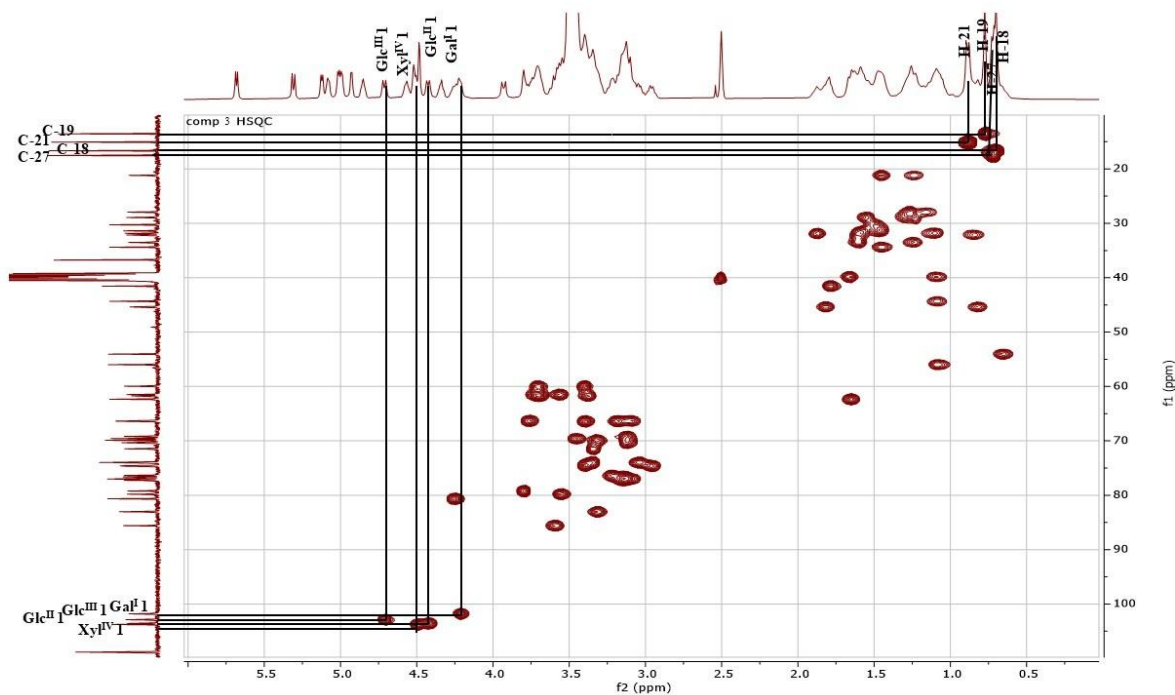


Figure S21. HSQC spectrum of compound 3.

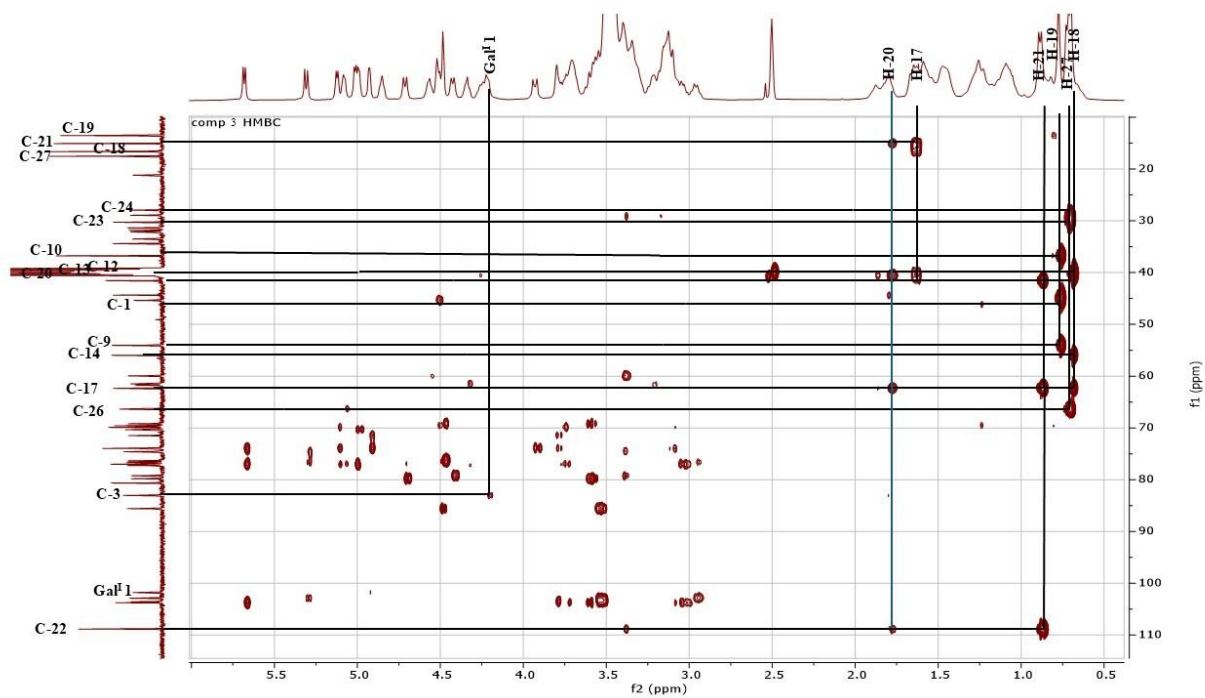


Figure S22. HMBC spectrum of compound 3.

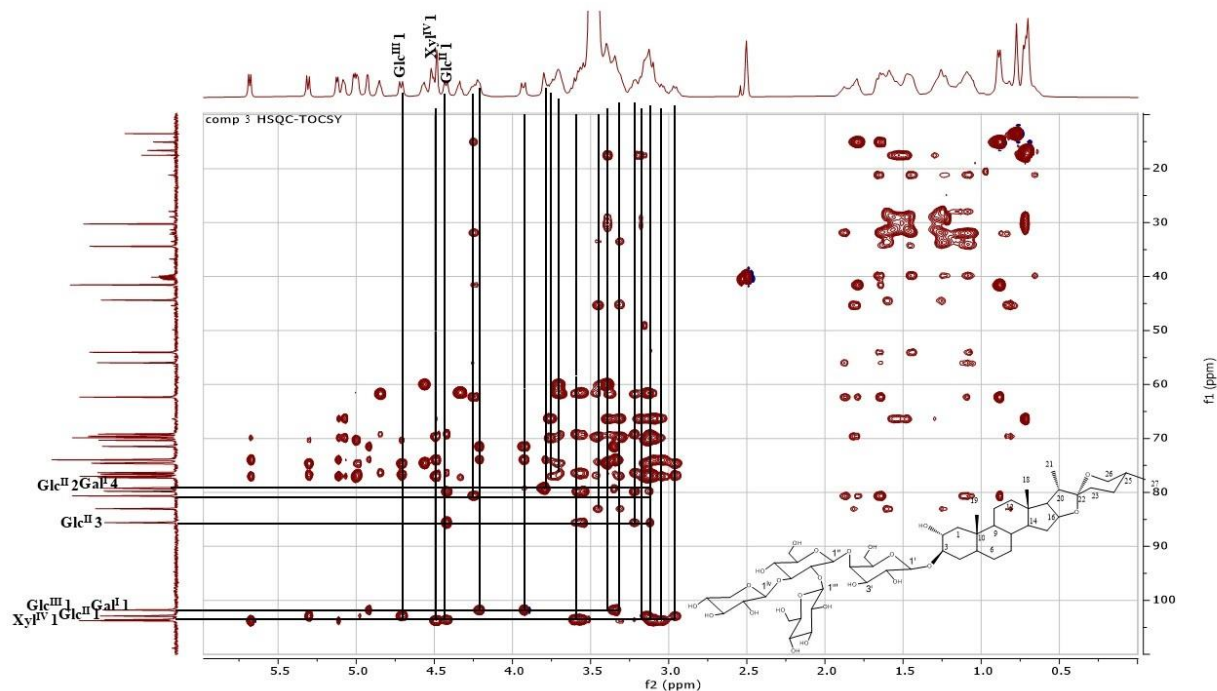


Figure S23. HSQC-TOCSY spectrum of compound 3.

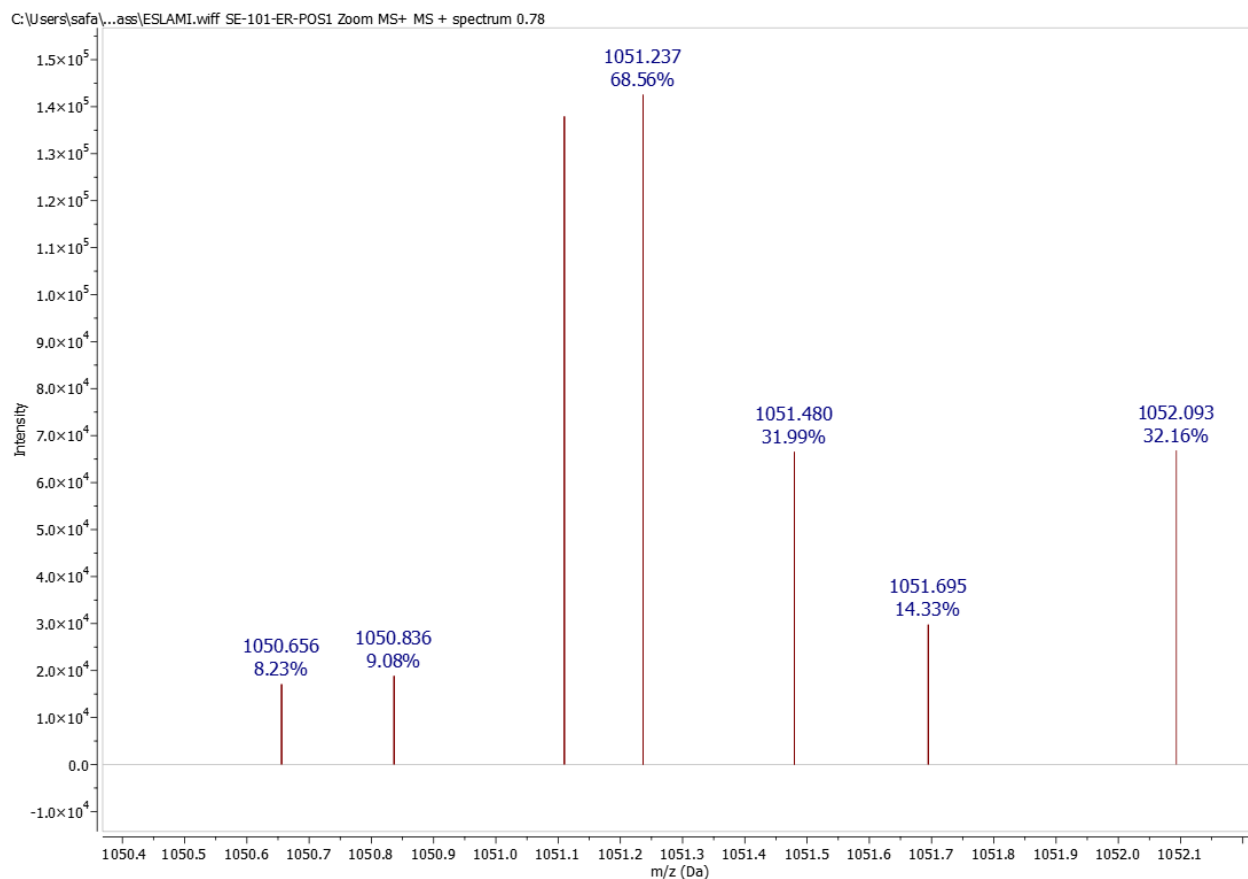


Figure S24. Positive ESI Mass spectrum of compound 3

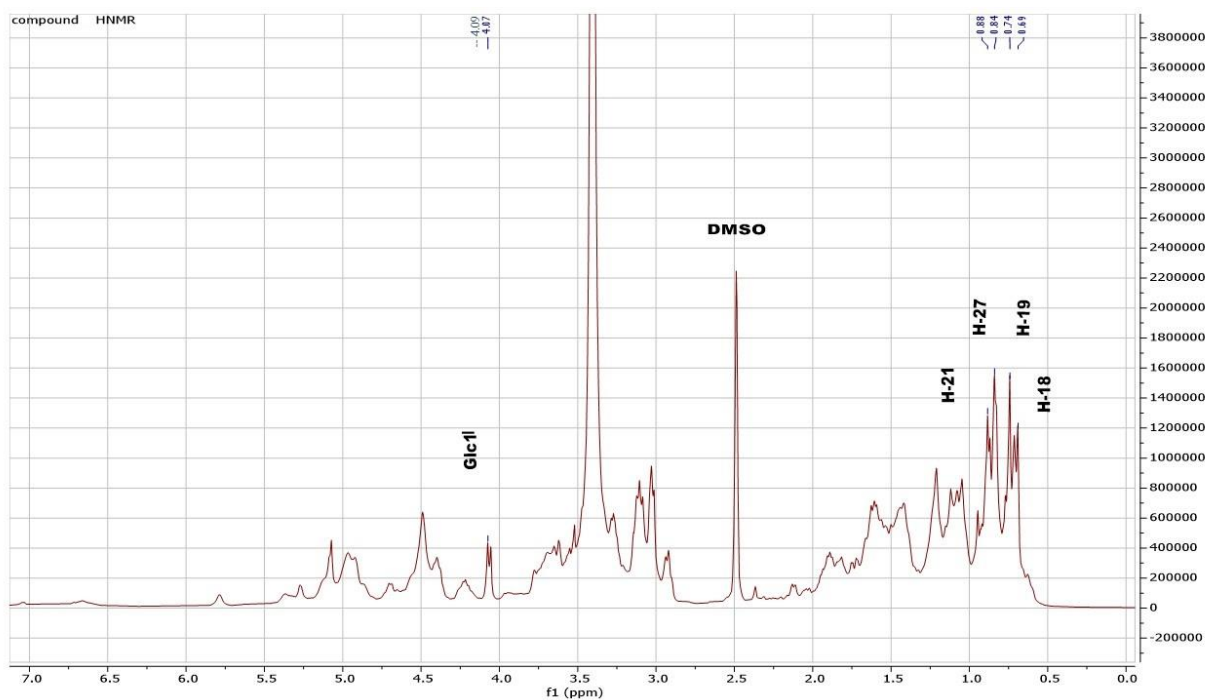


Figure S25. ^1H NMR (400 MHz, DMSO-d_6) spectrum of compound 4.

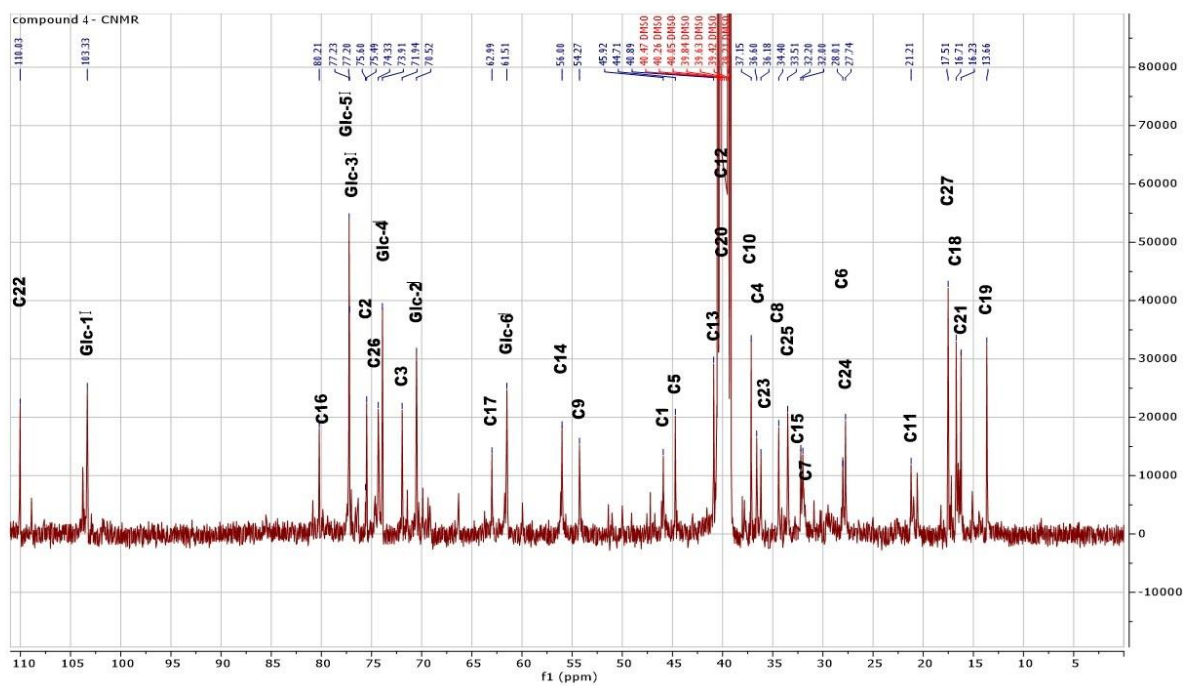


Figure S26. ^{13}C NMR (100 MHz, DMSO-d_6) spectrum of compound 4.

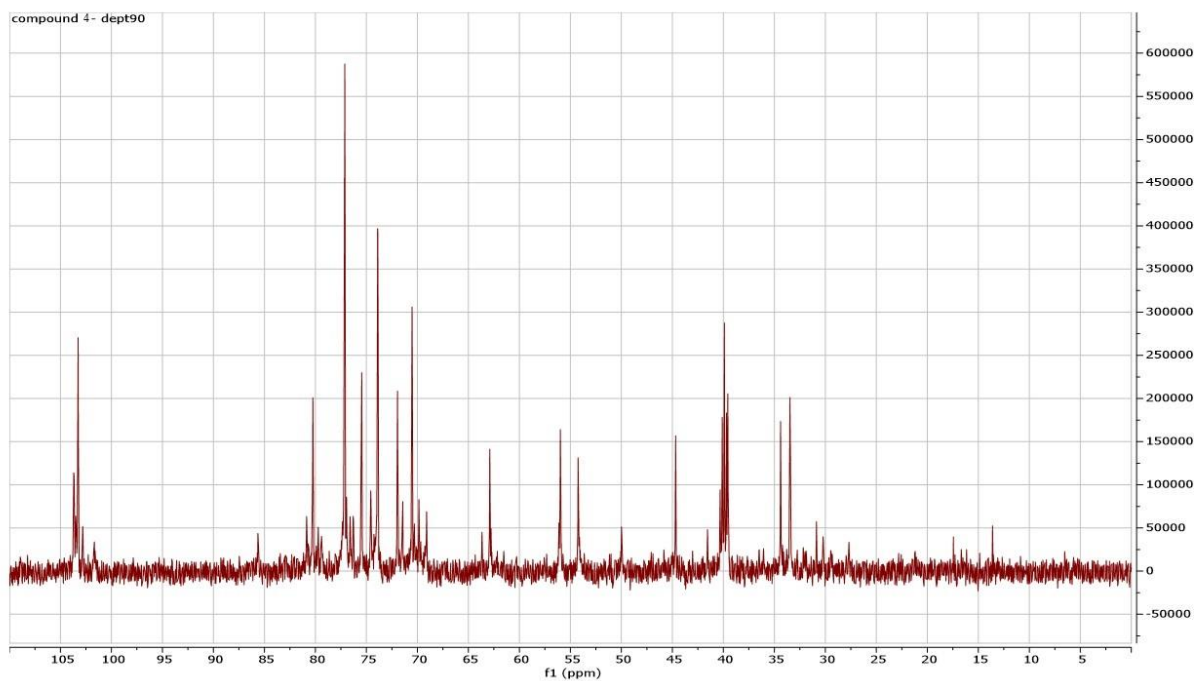


Figure S27. DEPT-90 spectrum of compound 4.

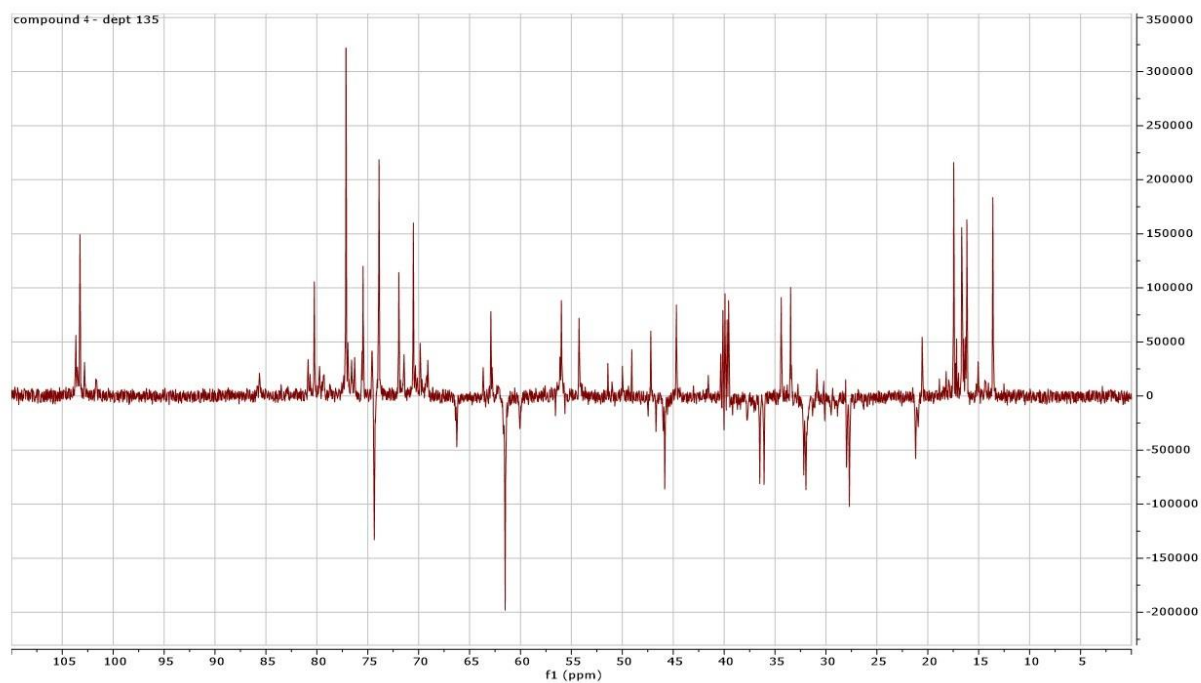


Figure S28. DEPT-135 spectrum of compound 4.

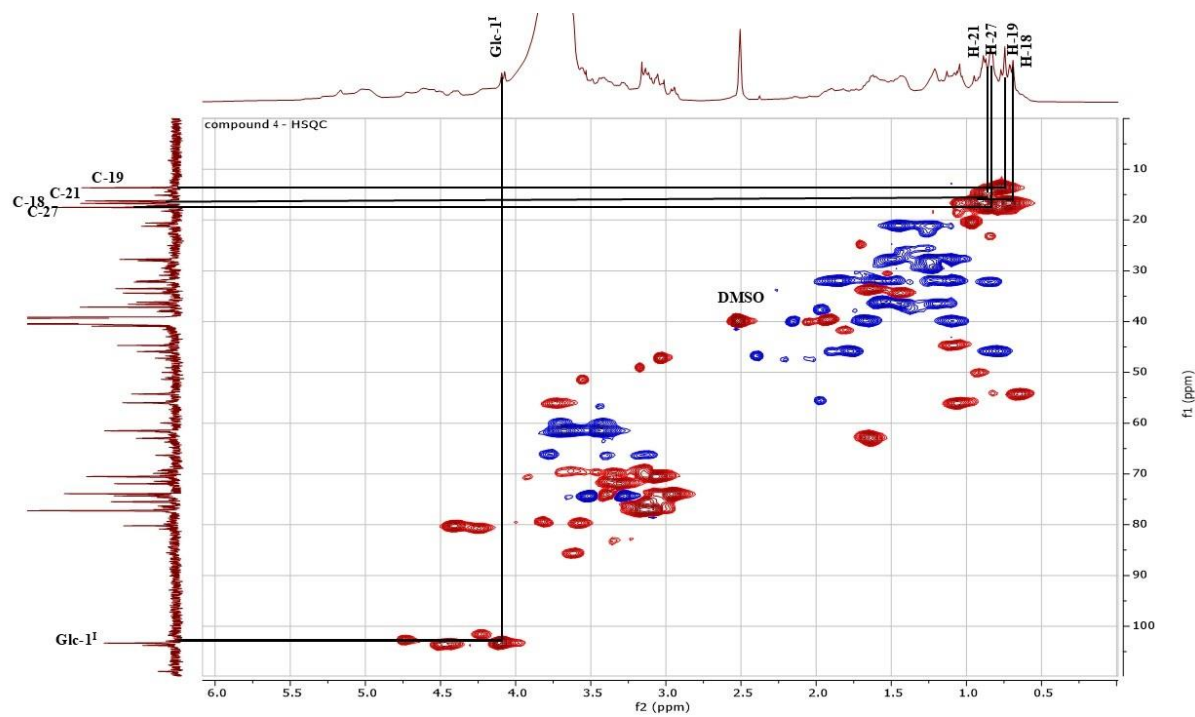


Figure S29. HSQC spectrum of compound 4.

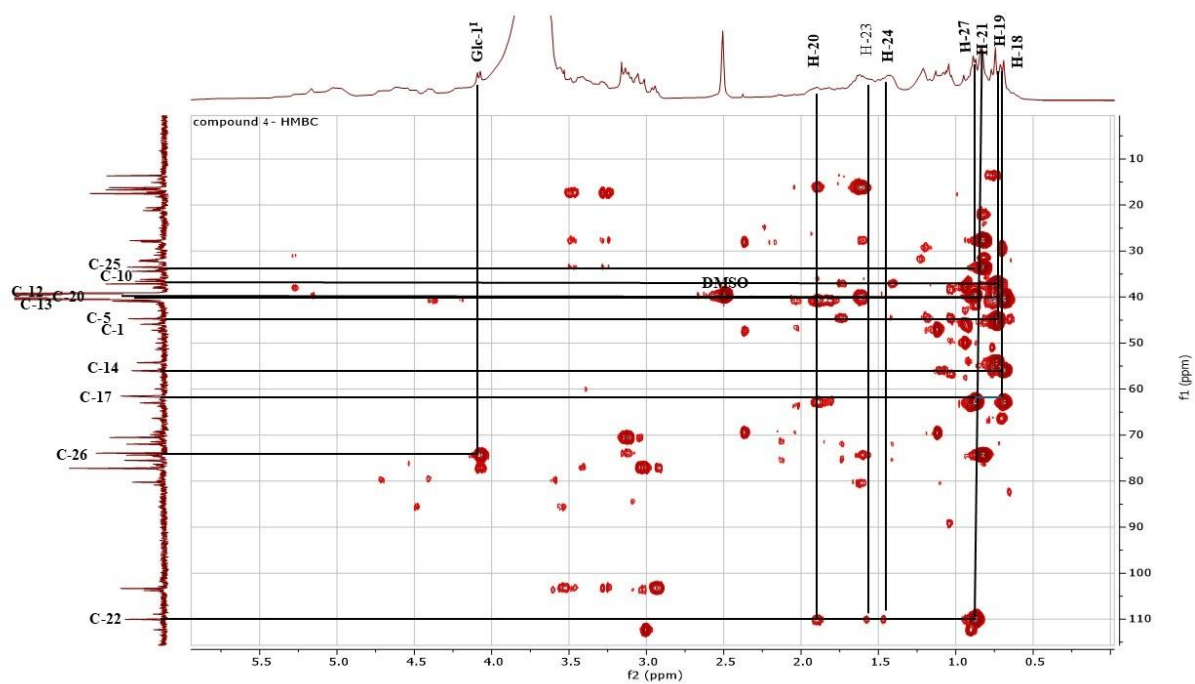


Figure S30. HMBC spectrum of compound 4.

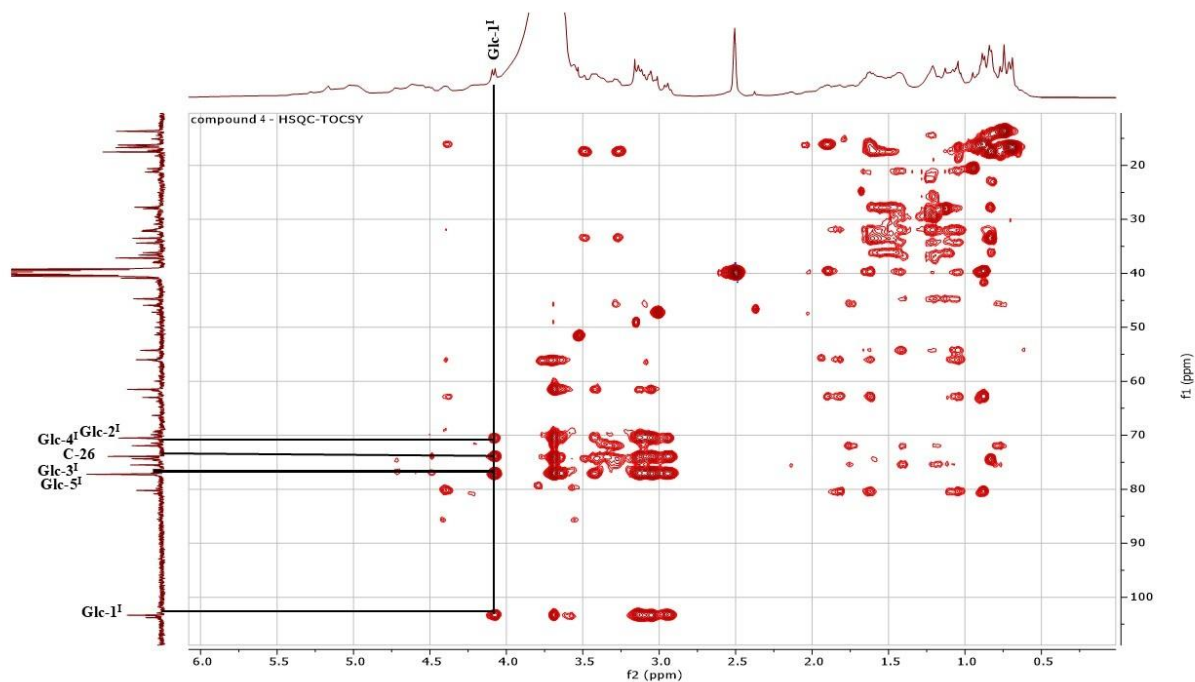


Figure S31. HSQC-TOCSY spectrum of compound 4.

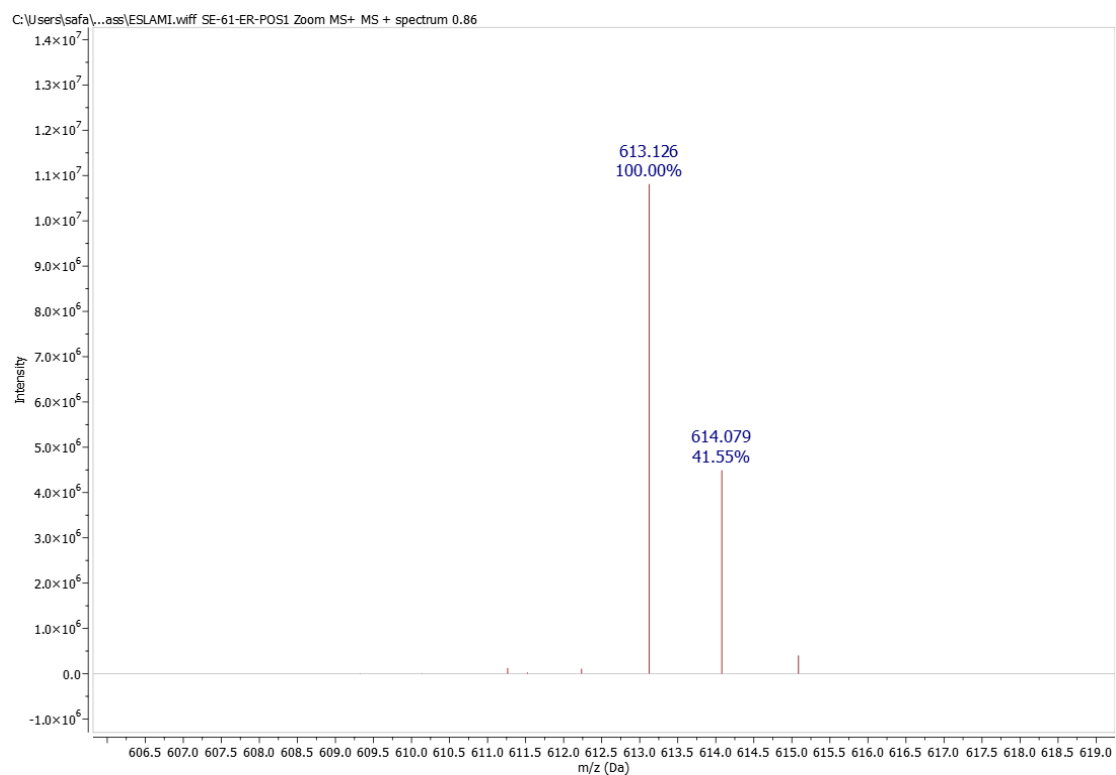


Figure S32. Positive ESI Mass spectrum of compound 4

Table S1. The list of primers sequences for real-time PCR

Primer	Sequence (5'-3')	Product (bp)	References
<i>bla_{KPC}</i>	F: CAACCTCGTCGCGGAACCAT	236	(1)
	R: ACCACGGAACCAGCGCATTT		
<i>oprL</i>	F: AACAGCGGTGCCGTTGAC	87	(2)
	R: GTCGGAGCTGTCGTACTCGAA		
<i>adeB</i>	F: AACGGACGACCATCTTTGAG	84	(3)
	R: CAGTTGTTCCATTTACGCA		
<i>acrA</i>	F: CTCTCAGGCAGCTTAGCCCTAA	107	(4)
	R: TGCAGAGGTTTCAGTTTGTACTGTT		
16SrRNA	F: ATGTTGGGTTAAGTCCCG	256	(5)
	R: CTAGCGATTCCRRCTTCA		

References:

1. Singh K, Mangold KA, Wyant K, Schora DM, Voss B, Kaul KL, Hayden MK, Chundi V, Peterson LR. Rectal screening for *Klebsiella pneumoniae carbapenemases*: comparison of real-time PCR and culture using two selective screening agar plates. J Clin Microbiol. 2012;50(8):2596-600.
2. Joly B, Pierre M, Auvin S, Colin F, Gottrand F, Guery B, Husson MO. Relative expression of *Pseudomonas aeruginosa* virulence genes analyzed by a real time RT-PCR method during lung infection in rats. FEMS Microbiol Lett. 2005;243(1):271-8.
3. Rafiei E, Shahini Shams Abadi M, Zamanzad B, Gholipour A. The frequency of efflux pump genes expression in *Acinetobacter baumannii* isolates from pulmonary secretions. AMB Express. 2022;12(1):103.
4. Swick MC, Morgan-Linnell SK, Carlson KM, Zechiedrich L. Expression of multidrug efflux pump genes *acrAB-tolC*, *mdfA*, and *norE* in *Escherichia coli* clinical isolates as a function of fluoroquinolone and multidrug resistance. Antimicrob Agents Chemother. 2011;55(2):921-4.

5. Mirzaei A, Nasr Esfahani B, Ghanadian M, Moghim S. *Alhagi maurorum* extract modulates quorum sensing genes and biofilm formation in *Proteus mirabilis*. Sci Rep. 2022;12(1):13992.