

# Chemical Composition of the Red Sea Green Algae *Ulva lactuca*: Isolation and In Silico Studies of New Anti COVID-19 Ceramides

## Additional Experimental Detail

1. **Figure S1.** Chromatogram of LC-ESI-HRMS analysis of crude extract of *Ulva lactuca* (positive mode)
2. **Figure S2.** Chromatogram of LC-ESI-HRMS analysis of crude extract of *Ulva lactuca* (negative mode)
3. **Figure S3.** Chromatogram of ESI-HRMS of compound 1
4. **Figure S4.**  $^1\text{H}$  NMR spectrum of compound 1
5. **Figure S5.**  $^{13}\text{C}$  NMR spectrum of compound 1
6. **Figure S6.** Expansion  $^{13}\text{C}$  NMR spectrum of compound 1
7. **Figure S7.** GC-MS analysis of fatty acid methyl ester of compound 1
8. **Figure S8.** Chromatogram of ESI-HRMS of compound 3
9. **Figure S9.**  $^1\text{H}$  NMR spectrum of compound 3
10. **Figure S10.**  $^{13}\text{C}$  NMR spectrum of compound 3
11. **Figure S11.** GC-MS analysis of fatty acid methyl ester of compound 3
12. **Figure S12.** Chromatogram of ESI-HRMS of compound 4
13. **Figure S13.**  $^1\text{H}$  NMR spectrum of compound 4
14. **Figure S14.**  $^{13}\text{C}$  NMR spectrum of compound 4
15. **Figure S15.** Expansion  $^{13}\text{C}$  NMR spectral data of compound 4
16. **Figure S16.** GC-MS analysis of fatty acid methyl ester of compound 4
17. **Figure S17.** Chromatogram of ESI-HRMS of compound 5
18. **Figure S18.**  $^1\text{H}$  NMR spectrum of compound 5
19. **Figure S19.**  $^{13}\text{C}$  NMR spectrum of compound 5
20. **Figure S20.** GC-MS analysis of fatty acid methyl ester of compound 5

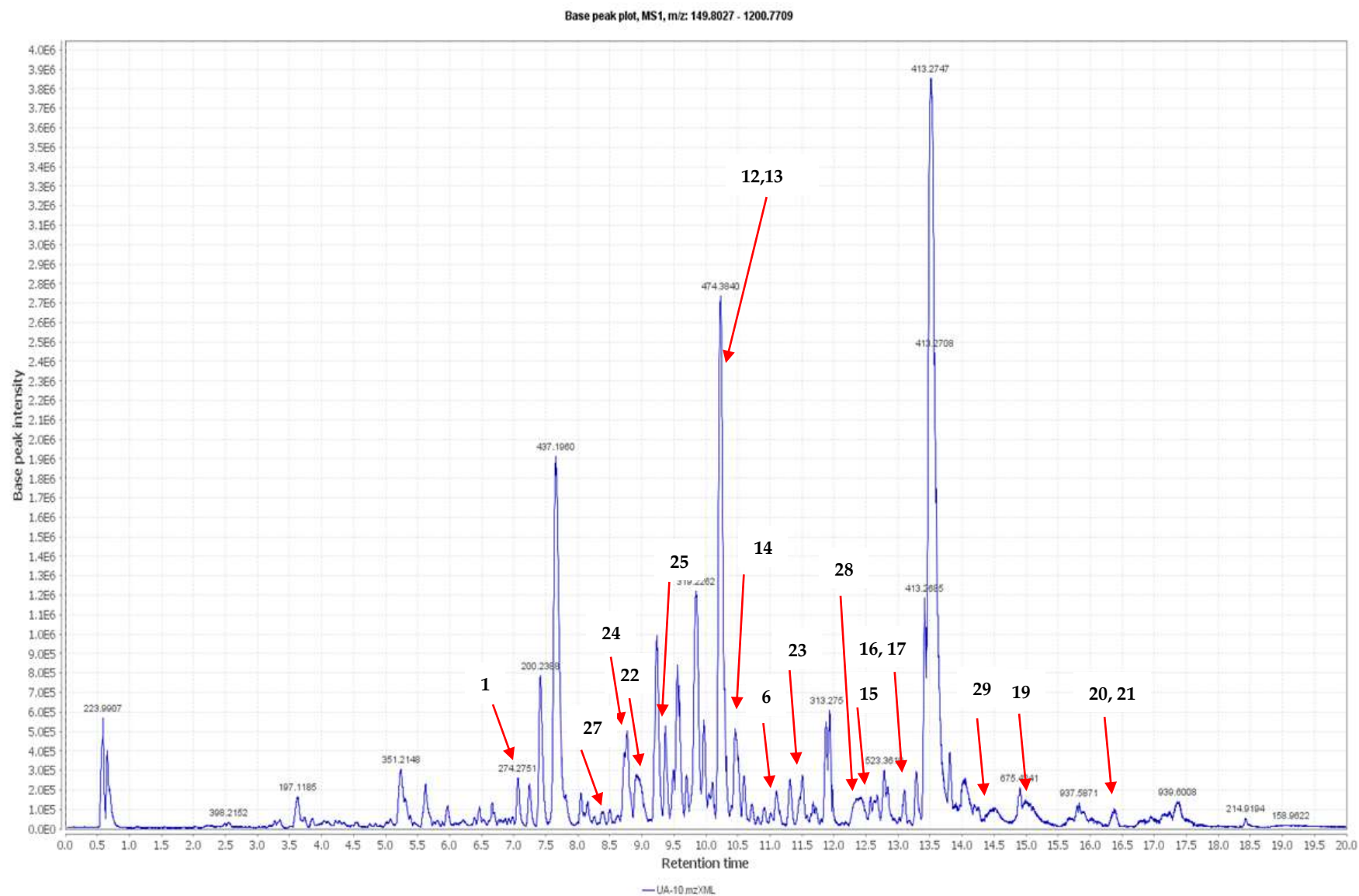
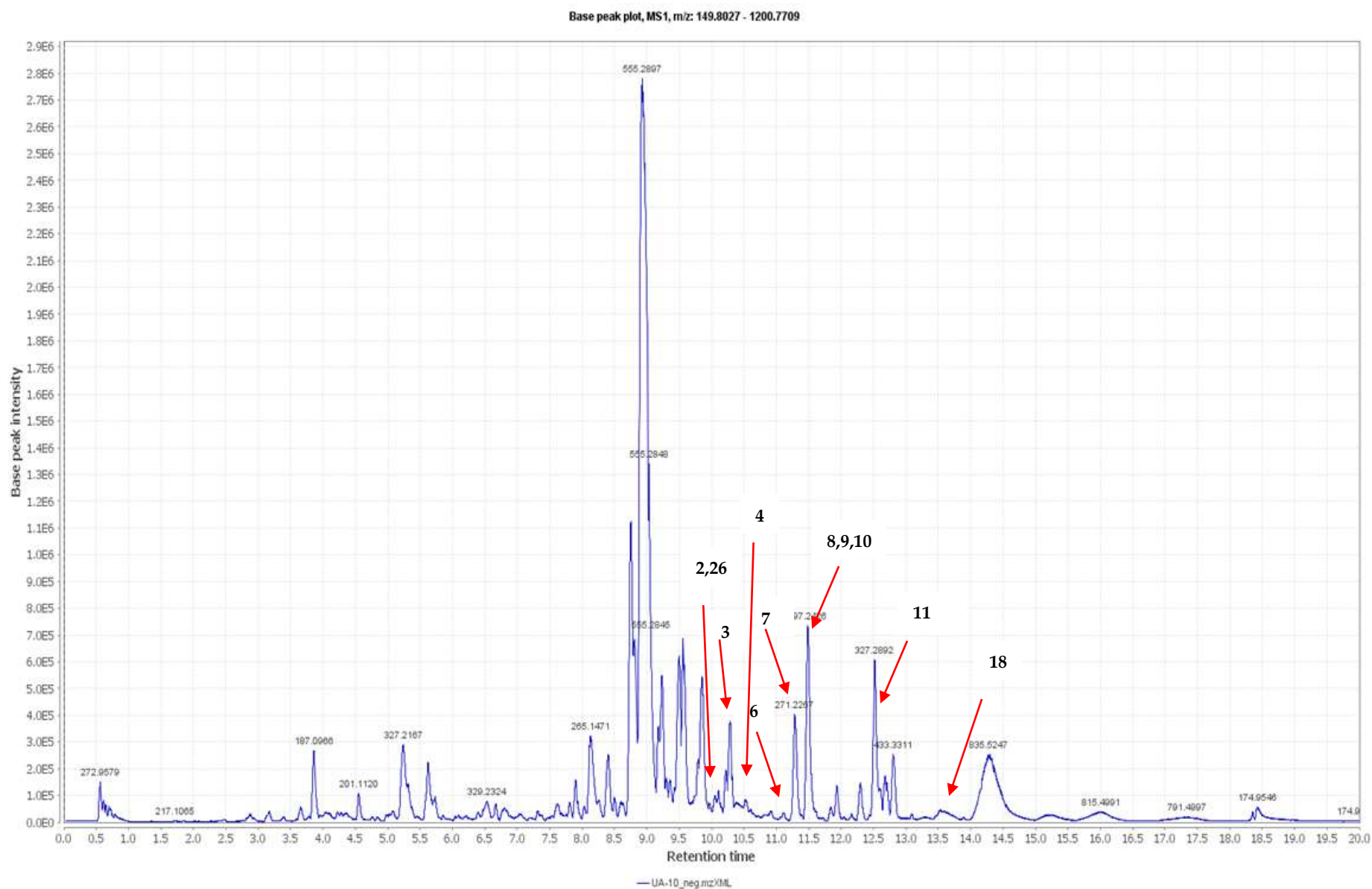
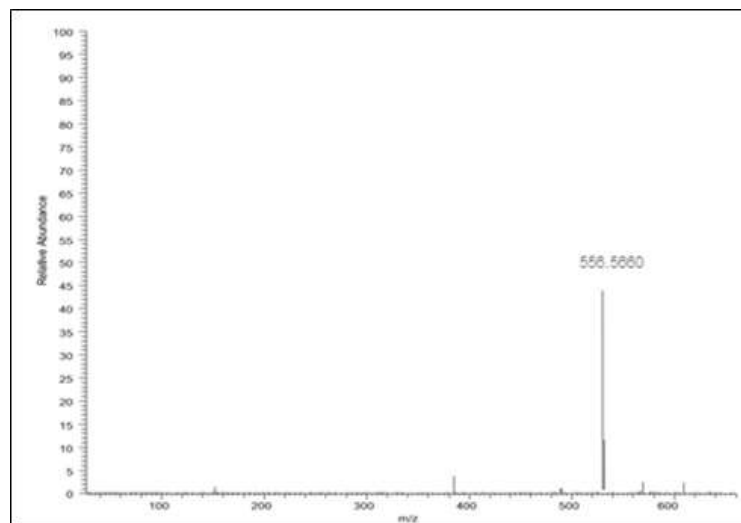


Figure S1. Chromatogram of LC-ESI-HRMS analysis of crude extract of *Ulva lactuca*. (positive mode).



**Figure S2.** Chromatogram of LC-ESI-HRMS analysis of crude extract of *Ulva lactuca* (negative mode).



**Figure S3.** Chromatogram of ESI-HRMS of compound **1**.

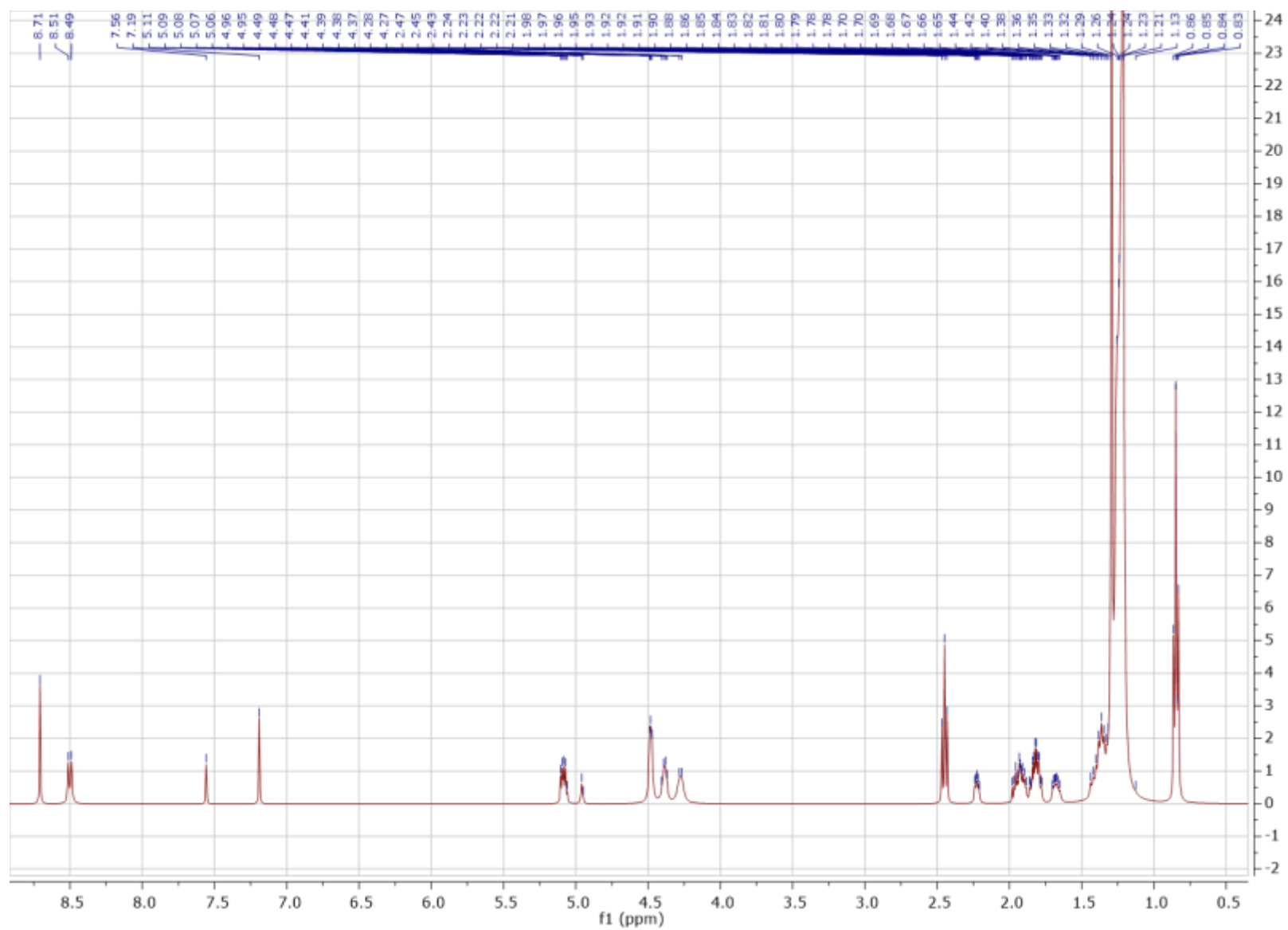


Figure S4.  $^1\text{H}$  NMR spectrum of compound 1.

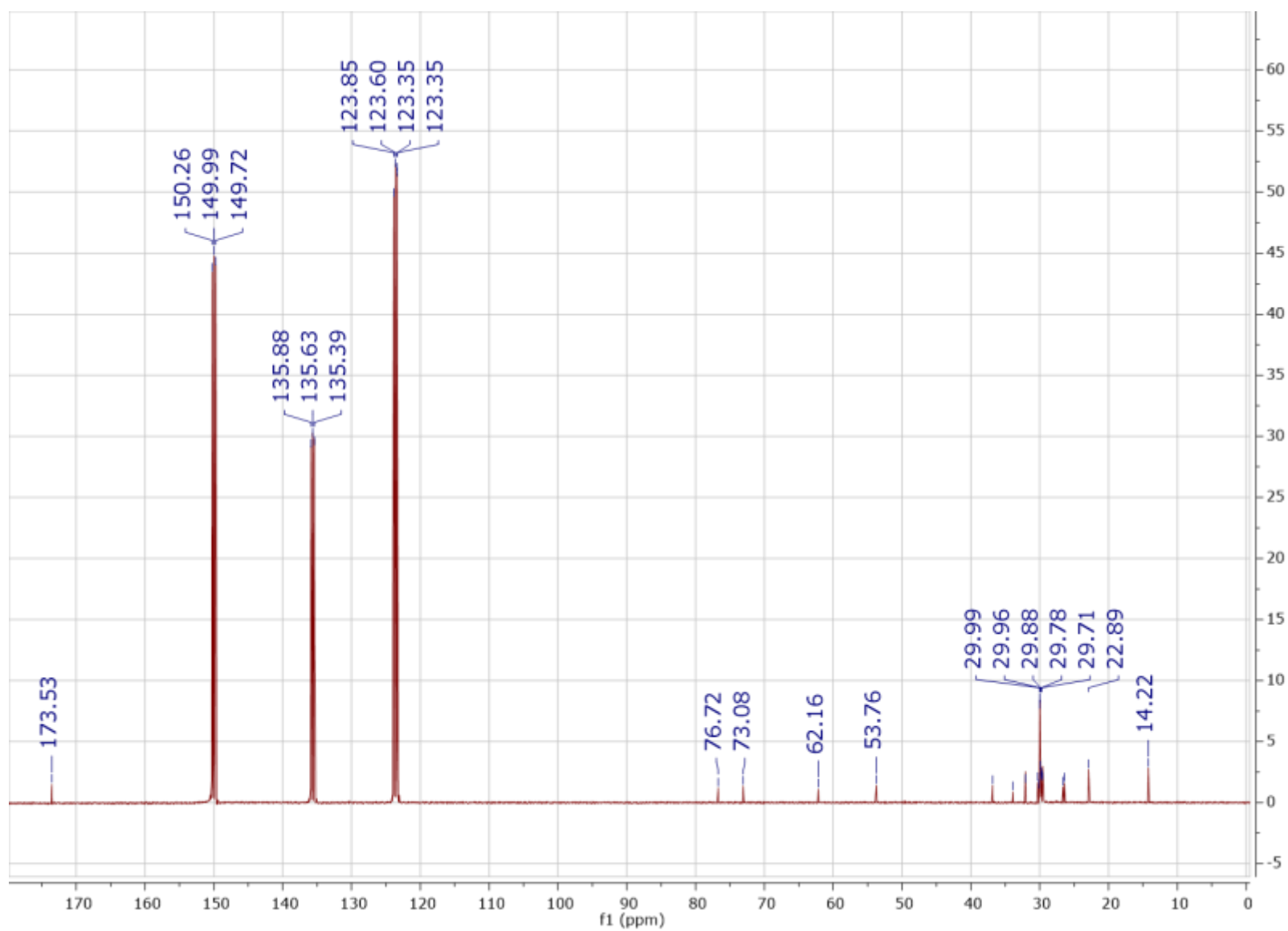


Figure S5.  $^{13}\text{C}$  NMR spectrum of compound 1.

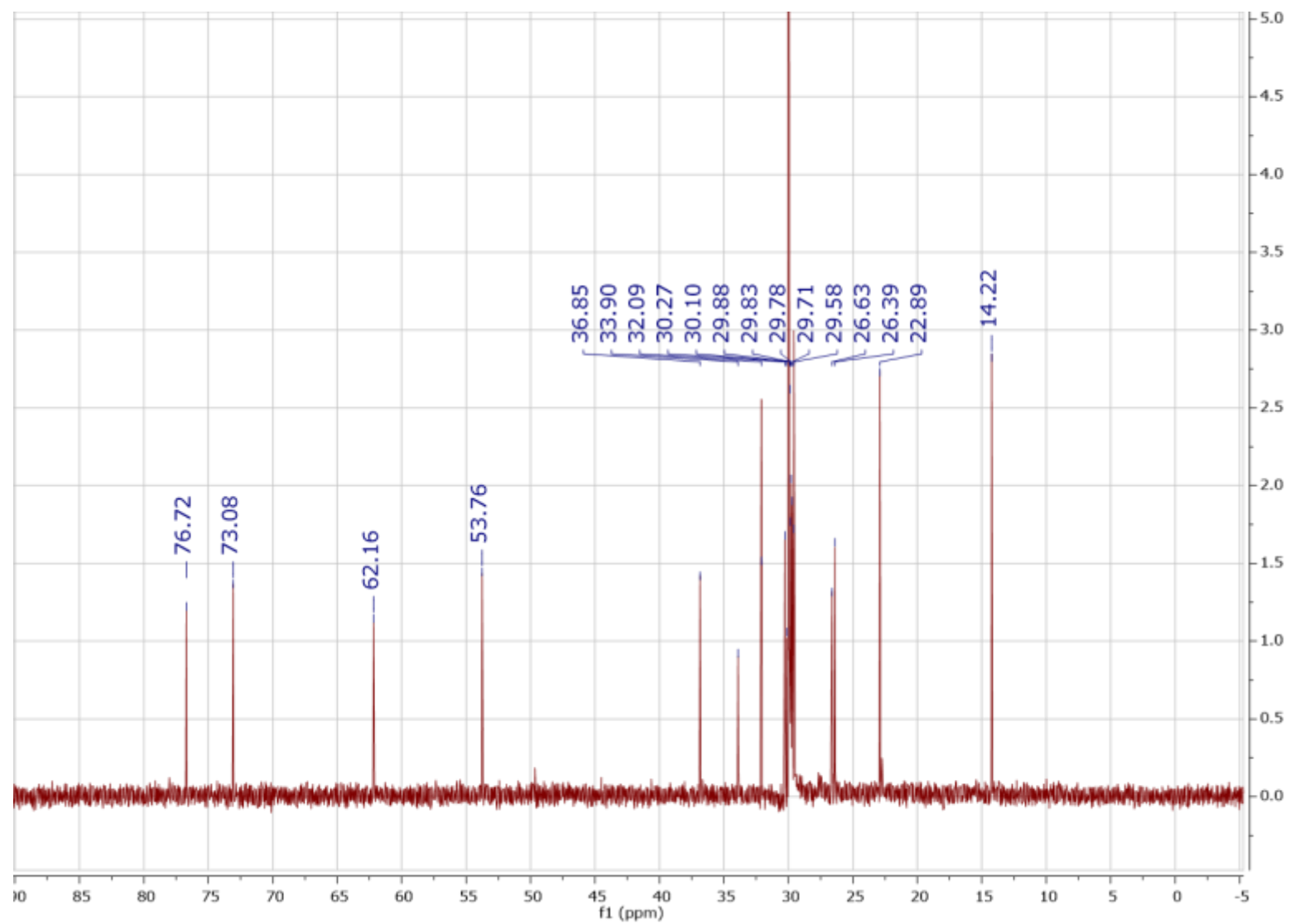
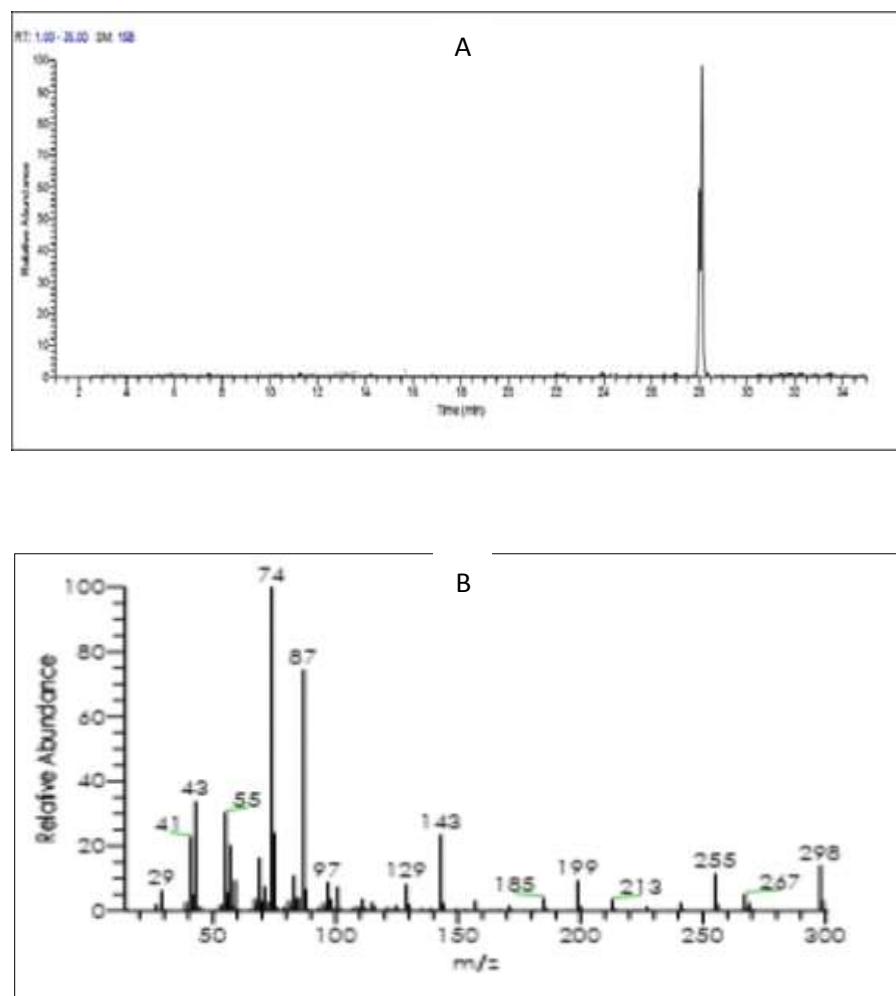
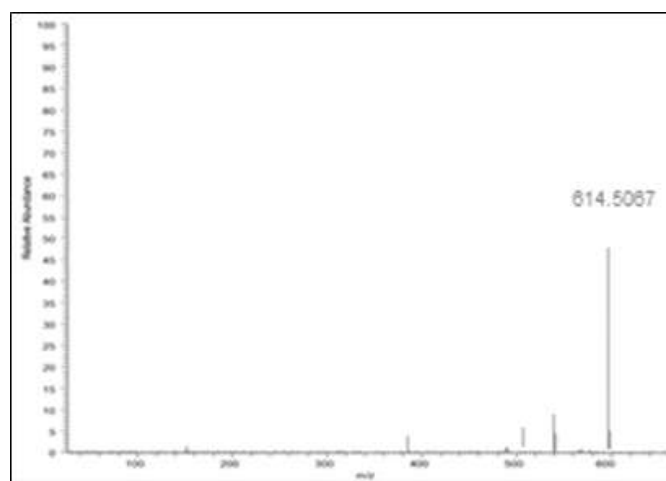


Figure S6. Expansion of  $^{13}\text{C}$  NMR spectrum of compound 1.



**Figure S7. A.** GC-MS chromatogram and **B.** Mass spectrum of fatty acid methyl ester of compound **1**.





**Figure S8.** Chromatogram of ESI-HRMS of compound **3**.

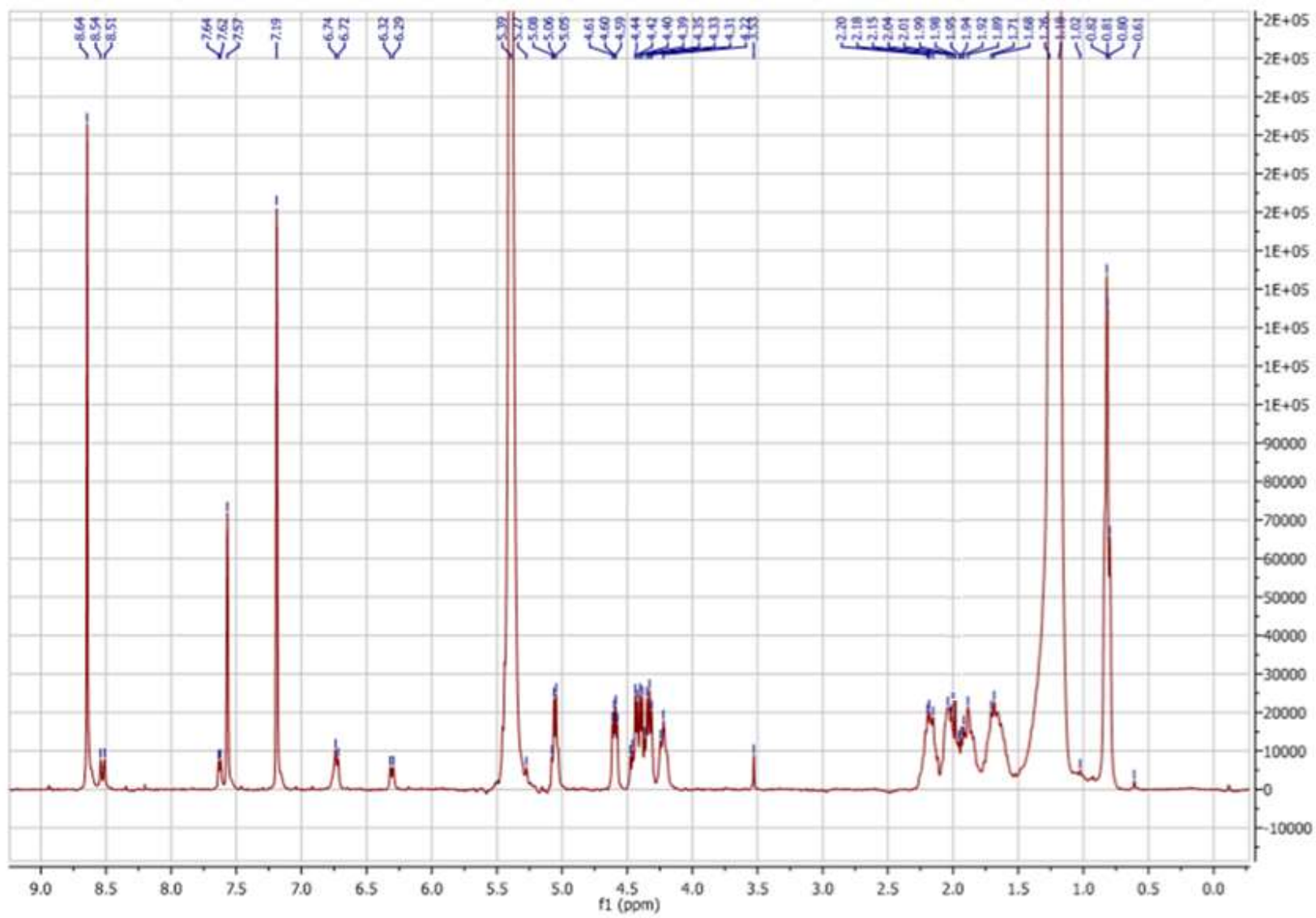


Figure S9. <sup>1</sup>H NMR spectrum of compound 3.

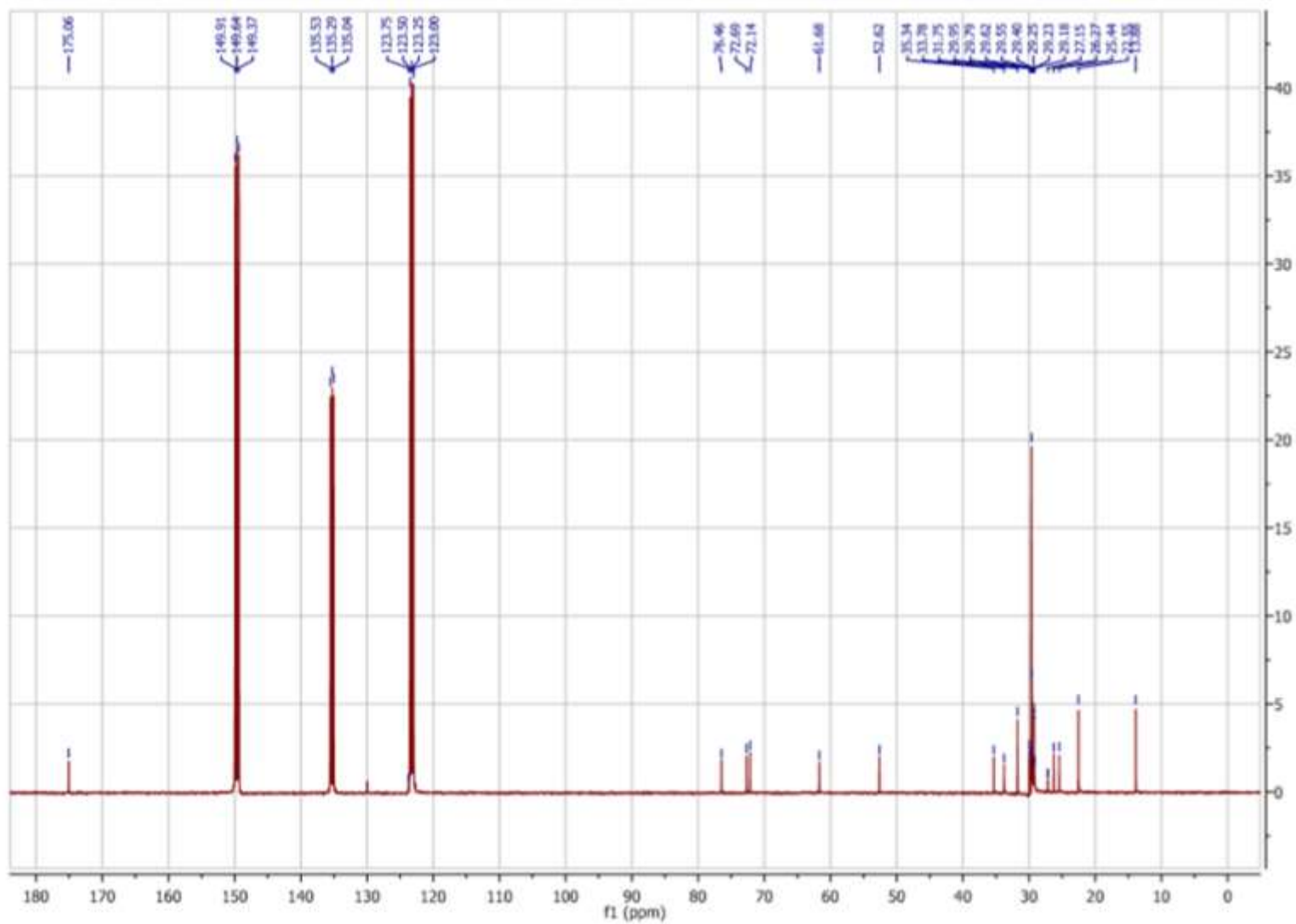
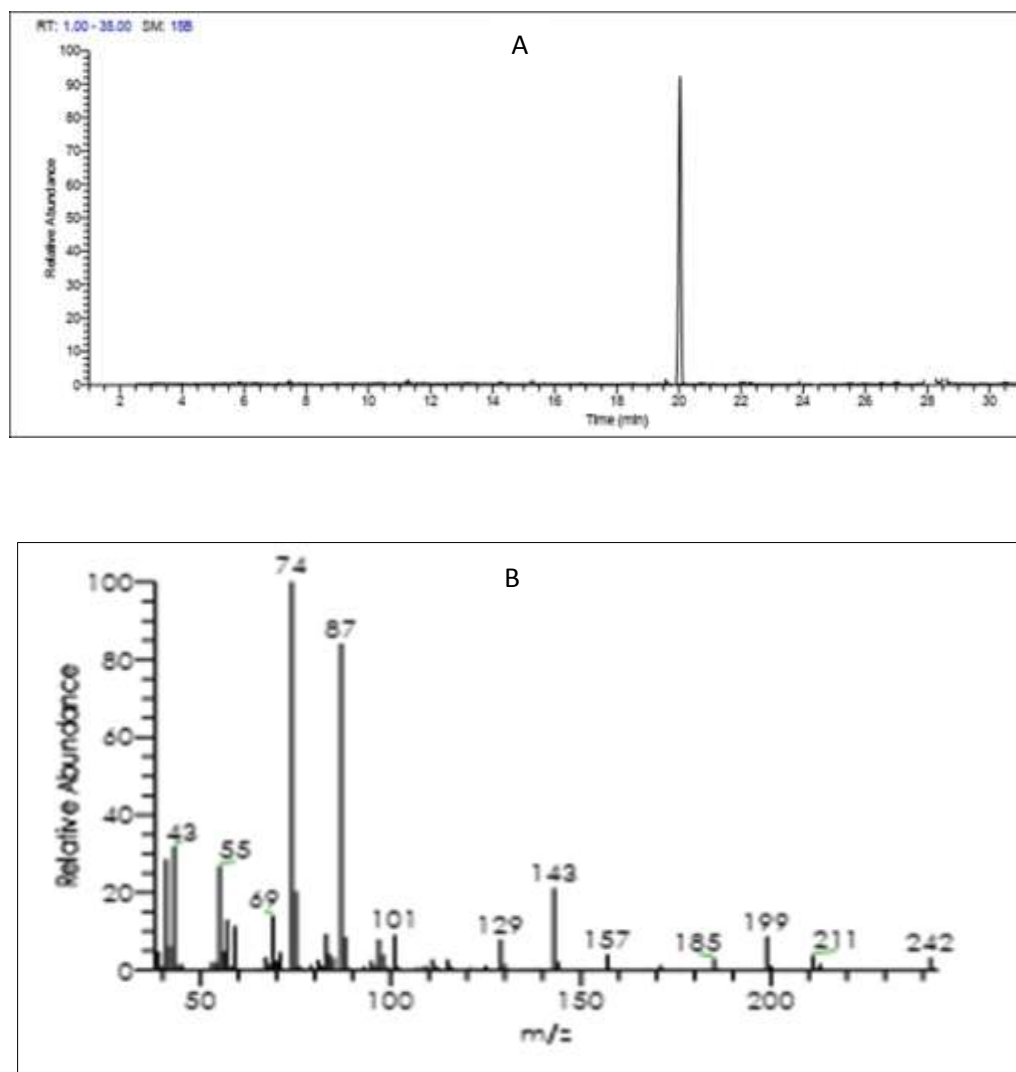
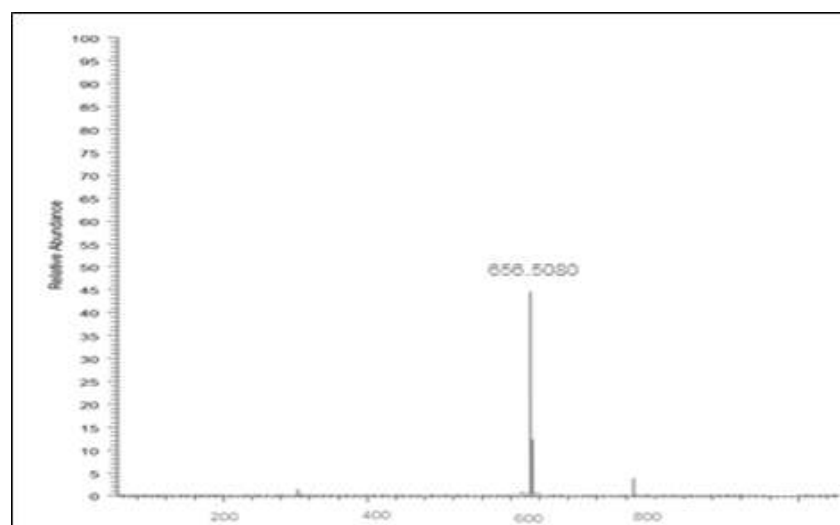


Figure S10. <sup>13</sup>C NMR spectrum of compound 3.



**Figure S11.** A. GC-MS chromatogram and B. Mass spectrum of fatty acid methyl ester of compound 3.



**Figure S12.** Chromatogram of ESI-HRMS of compound **4**.

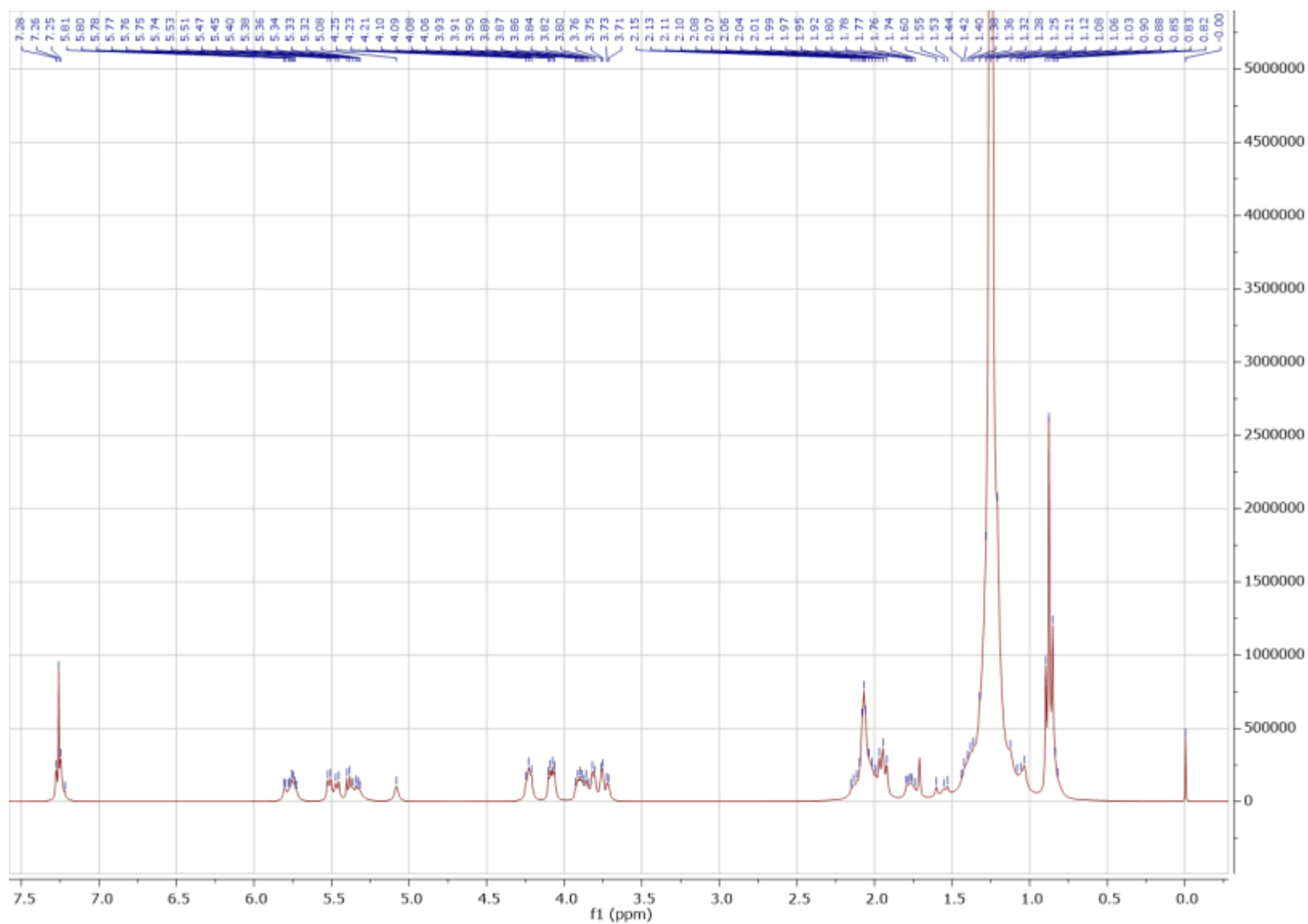


Figure S13. <sup>1</sup>H NMR spectrum of compound 4.

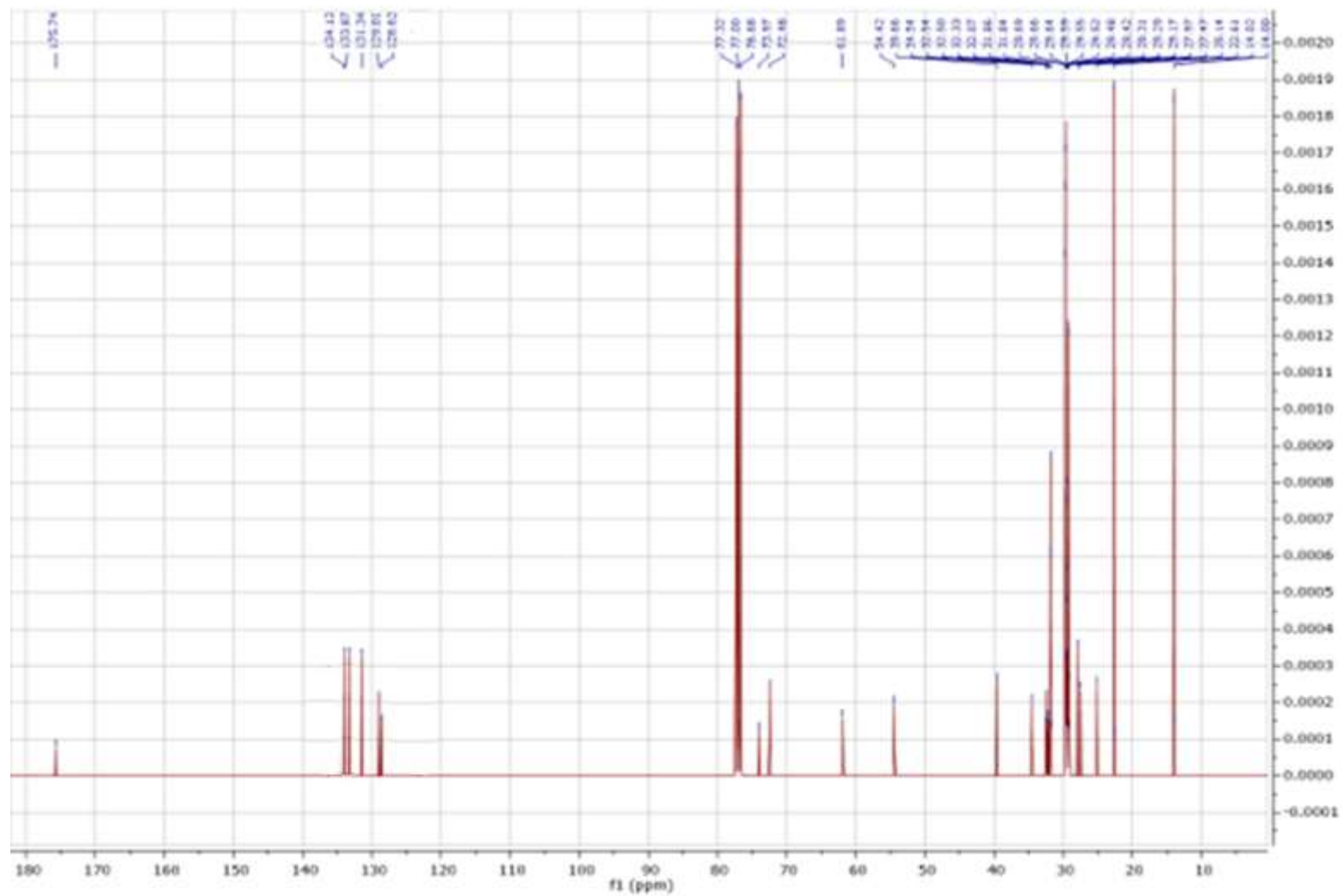
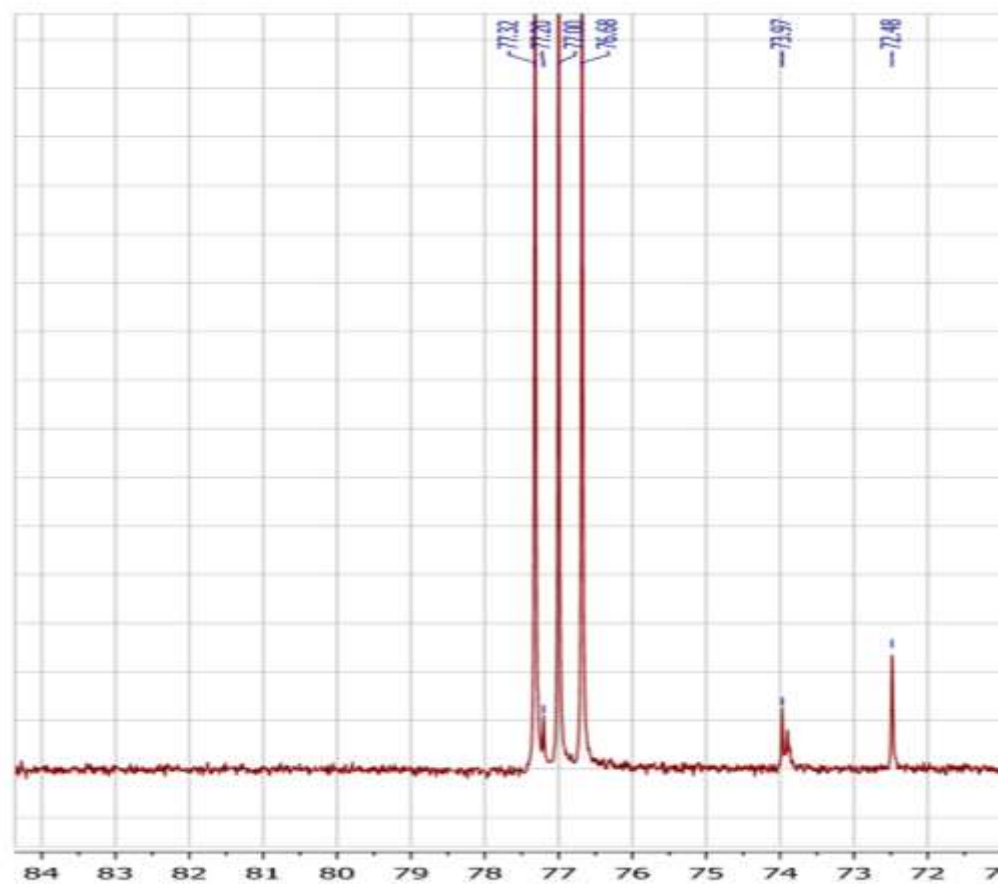
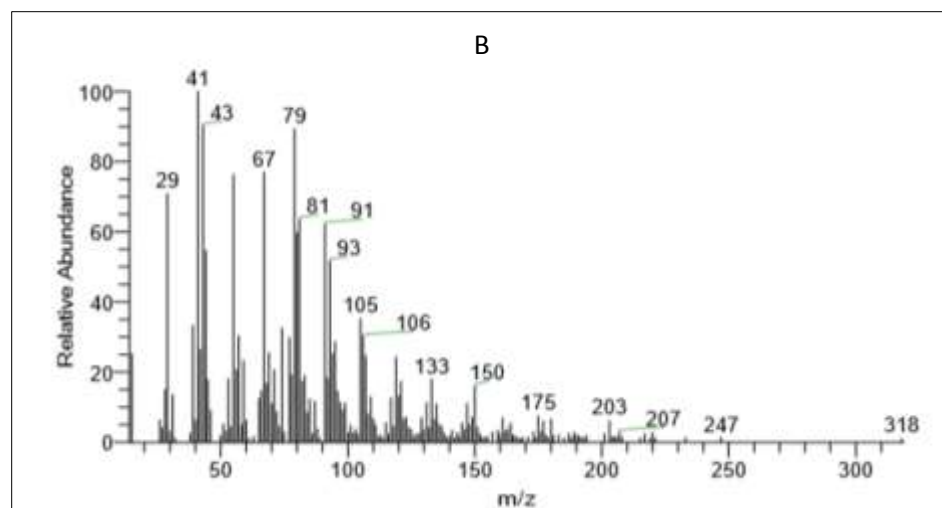
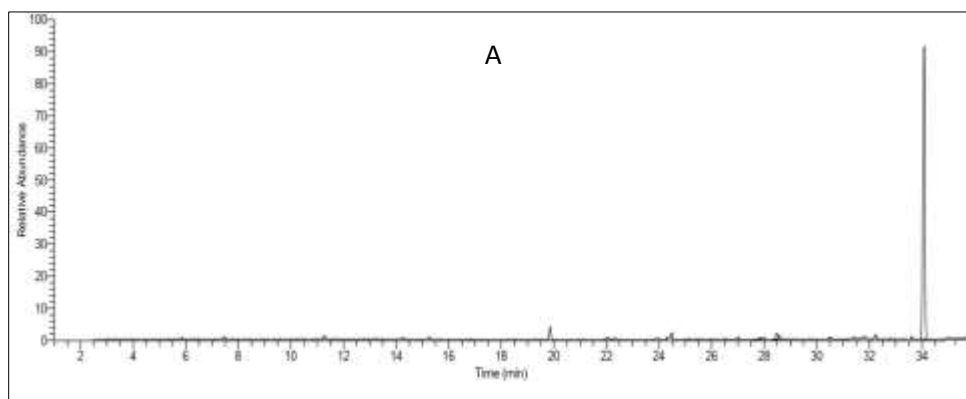


Figure S14.  $^{13}\text{C}$  NMR spectrum of compound **4**.

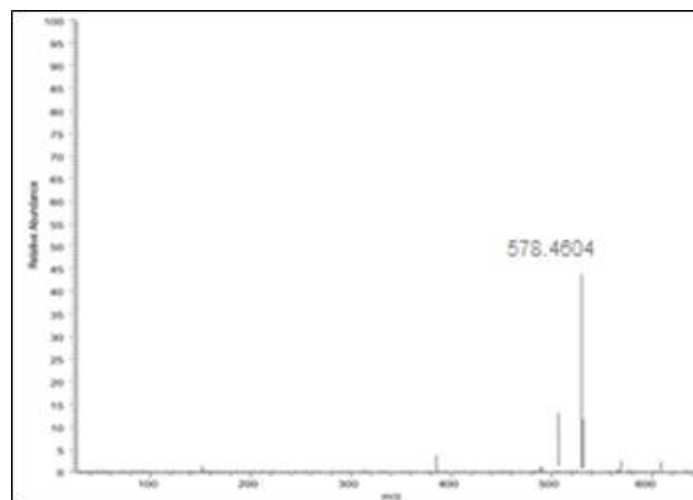


**Figure S15.** Expansion of  $^{13}\text{C}$  NMR spectrum of compound 4.





**Figure S16.** A. GC-MS chromatogram and B. Mass spectrum of fatty acid methyl ester of compound **4**



**Figure S17.** Chromatogram of ESI-HRMS of compound **5**.



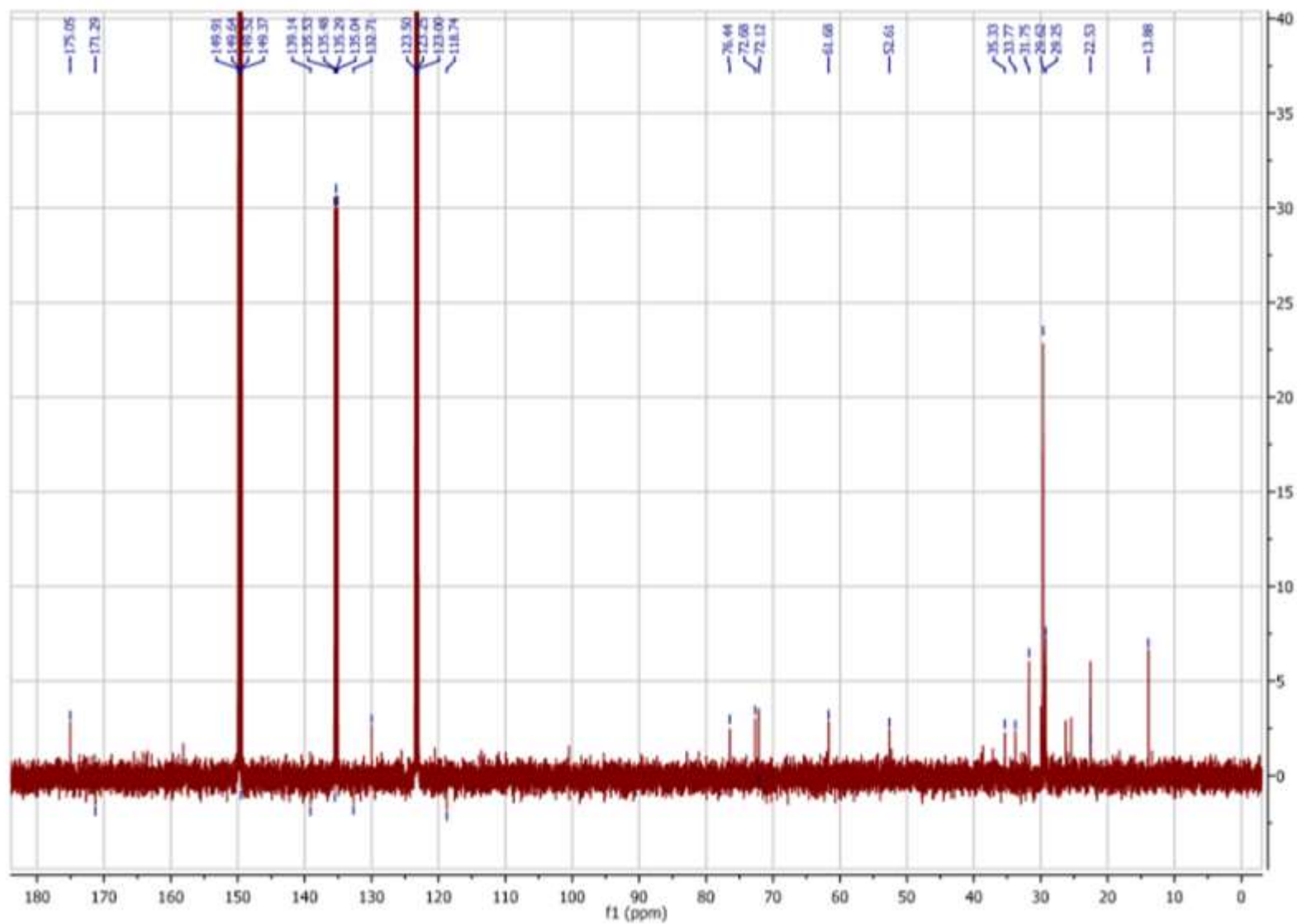
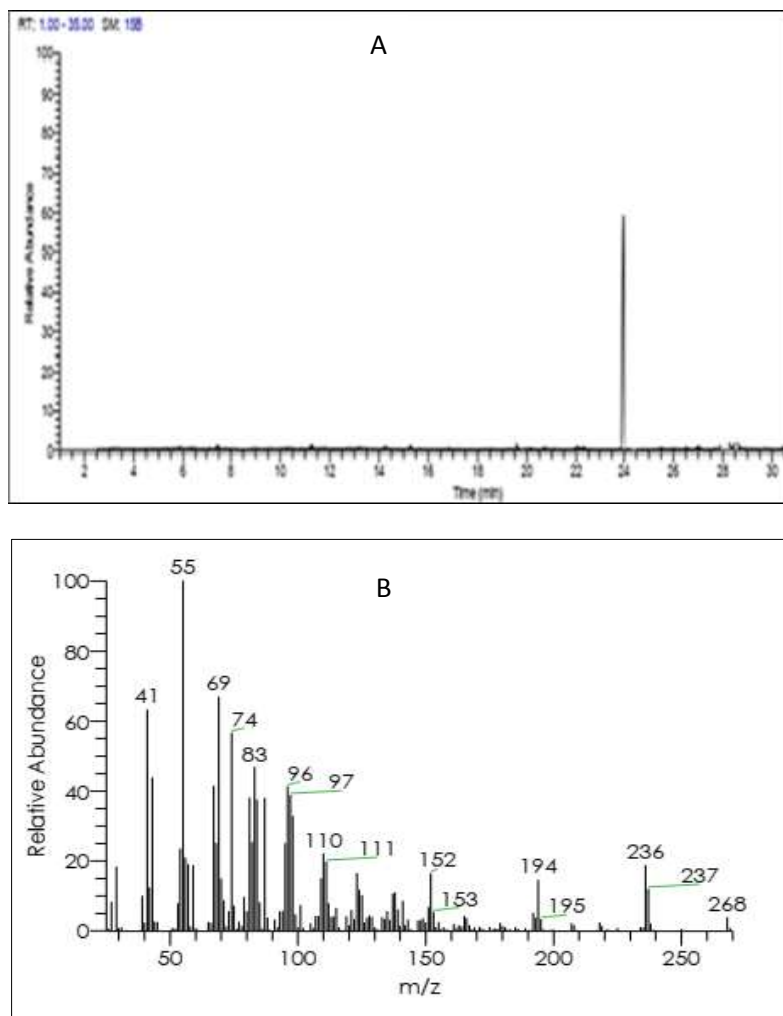


Figure S19. <sup>13</sup>C NMR spectrum of compound 5.



**Figure S20.** A. GC-MS chromatogram and B. Mass spectrum of fatty acid methyl ester of compound 5.