

Supporting Information

Diterpenoids from *Azorella madreporica* and their Antibacterial

Activity

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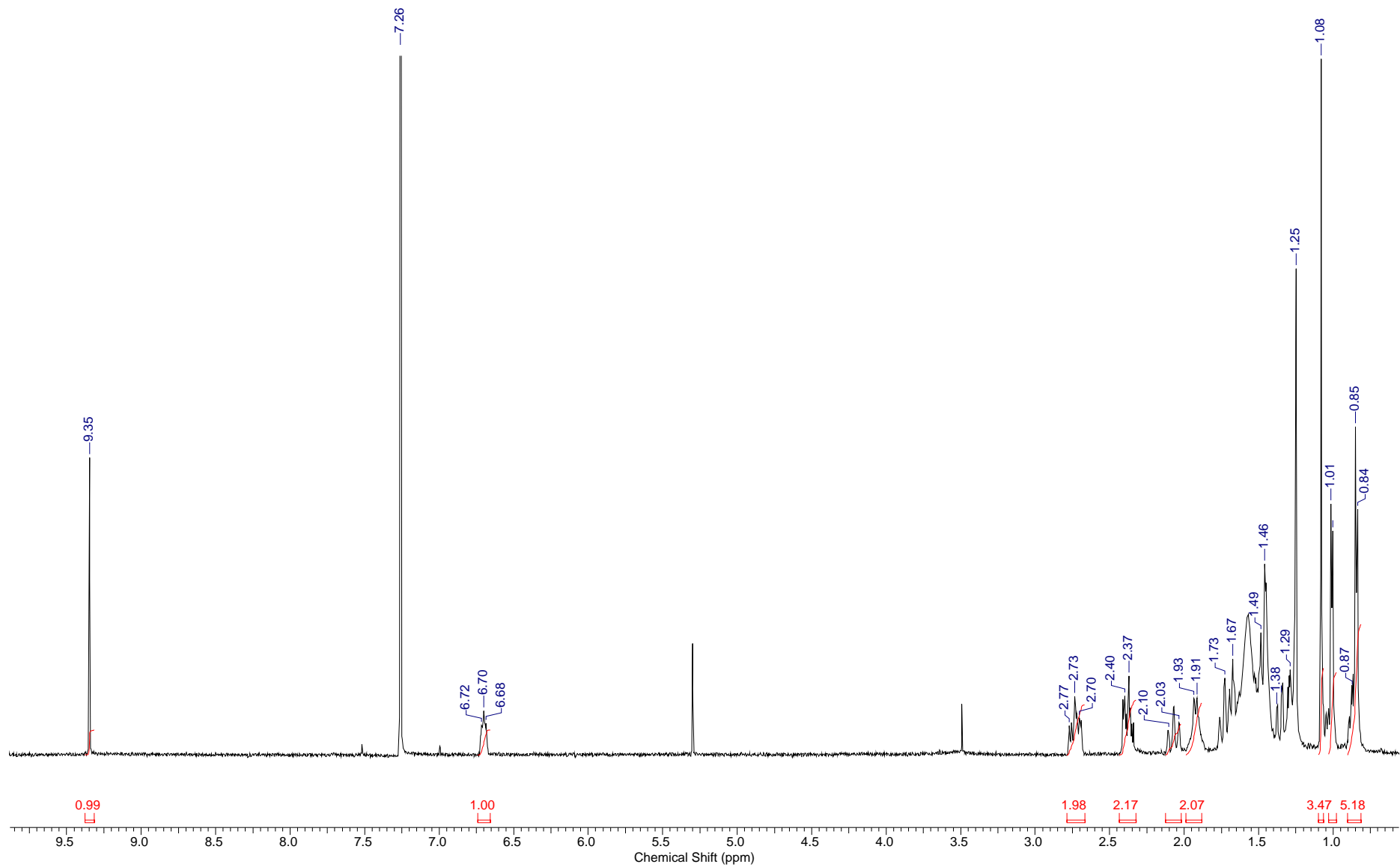


Fig. 1S $^1\text{H-NMR}$ spectrum of compound **1**(CDCl_3).

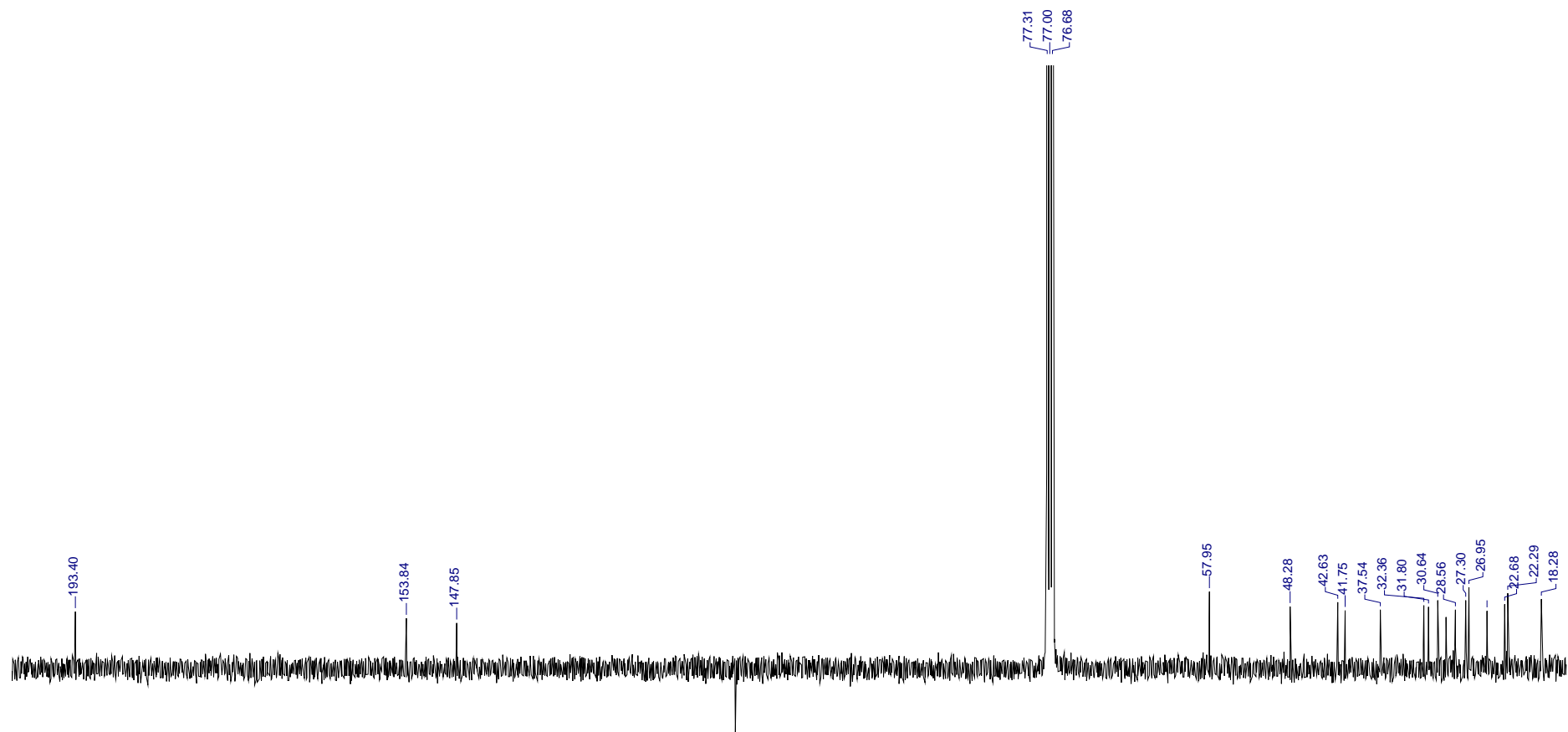


Fig. 2S ^{13}C -NMR spectrum of compound **1**(CDCl_3).

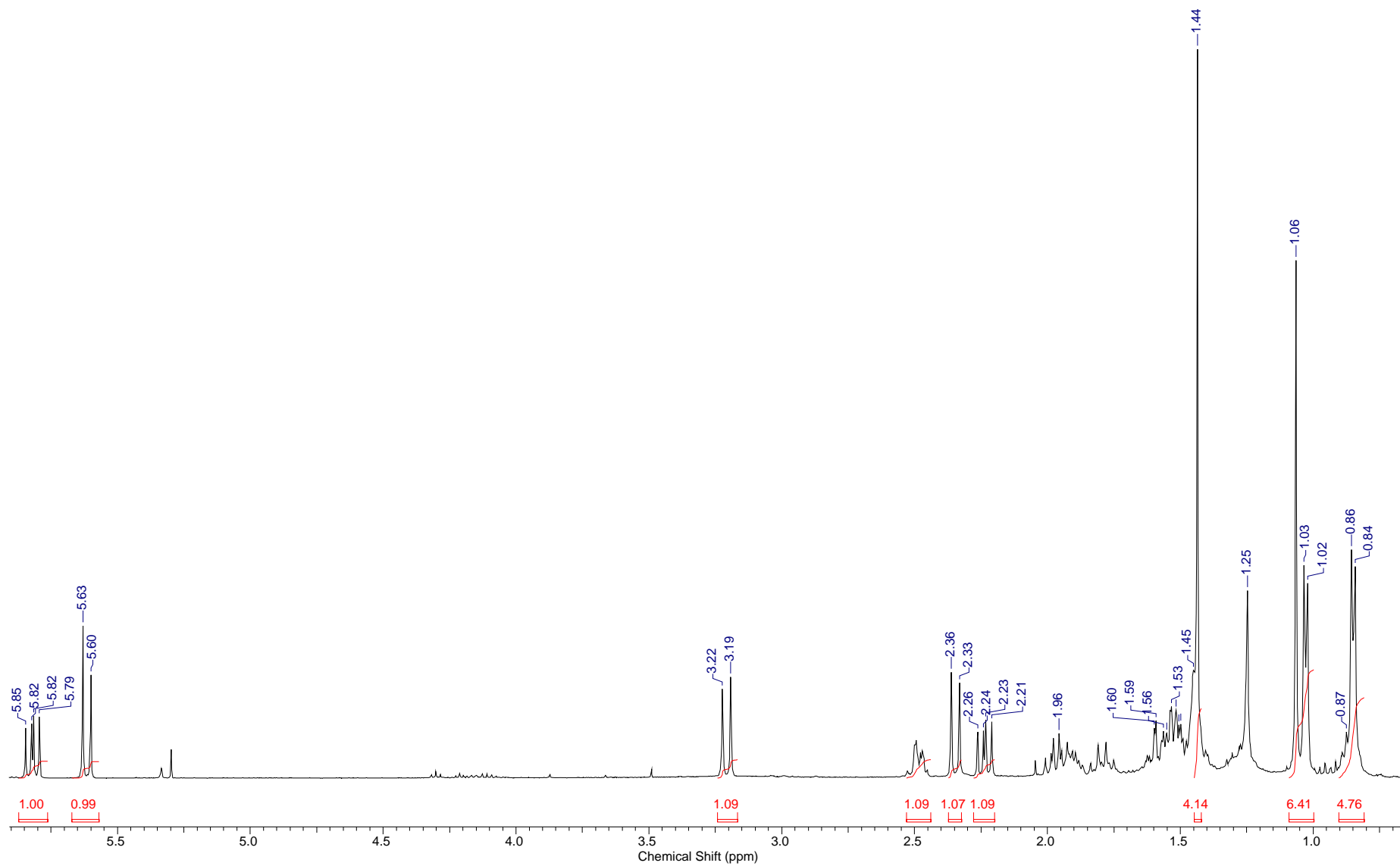


Fig. 3S $^1\text{H-NMR}$ spectrum of compound **2**(CDCl_3).

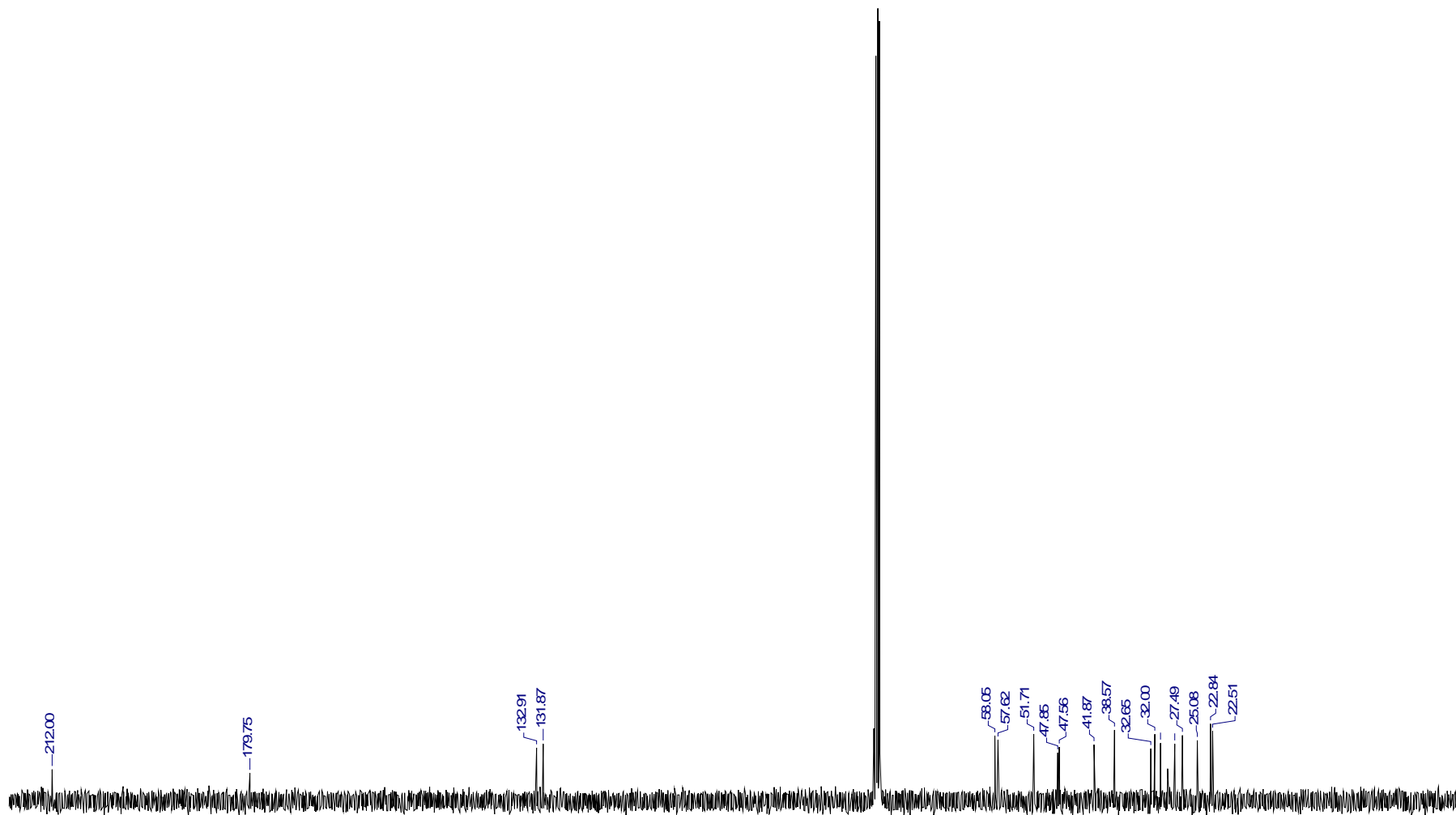


Fig. 4S ^{13}C -NMR spectrum of compound **2**(CDCl_3).

Antibacterial assay

The antibacterial activity was determined in solid media by the paper disk diffusion method [5]. After the inoculum medium agar had dried, disks containing 50, 100, and 200 µg of compounds **1** and **2** were placed on the agar and the plates were incubated overnight. The microorganisms used were from the Plant Health Department, University of Chile, Chile: *Pseudomonas syringae* pv *syringae* 812, *Xanthomonas arboricola* pv *juglandis* 833, *Erwinia carotovora* 844, *Agrobacterium tumefaciens* A348 (which are Gram-negative bacteria), and *Clavibacter michiganensis* 807 (Gram positive bacteria). Benzylpenicillin and streptomycin were used as positive control antibiotics. The MIQ (average quantity needed for the bacterial growth inhibition) of benzylpenicillin was 0.01 µg for *C. michiganensis* 807, 1 µg for *X. arboricola* pv *juglandis* 833, and over 25 µg for the other strains. In the case of streptomycin, the MIQ was between 0.5 and 2 µg for all the bacteria.

Physical properties, EIMS, and IR data

Mulin-12-en-16-al-20-oic acid (**1**): white powder; m.p. 156-159 °C; $[\alpha]_D^{20}$ -52.0 (*c* 0.06, CHCl₃); FT-IR ν_{\max} : 3400-2500 br, 2740, 1690, 1643, 1448, 1247, 1185 cm⁻¹; HREIMS: calcd. for C₂₀H₃₀O₃ (M⁺): 318.2194, found: 318.2193; EI-MS: *m/z* (rel. int. %): 318 [M⁺] (14), 300 (15), 272 (82), 255 (24), 229 (100), 221 (27), 189 (80), 175 (43), 147 (57), 139 (33), 119 (30), 107 (37), 105 (42), 91 (48), 79 (43), 67 (33).

13- α -hydroxy-mulin-11-en-14-one-20-oic acid (**2**): pale yellow oil; $[\alpha]_D^{20}$ + 92.0 (*c* 0.05, CHCl₃); FT-IR ν_{\max} : 3380, 3300-2500 br, 1710, 1688, 1457, 1383, 1245, 1149, 935 cm⁻¹; HREIMS: calcd. for C₂₀H₃₀O₄ (M⁺): 334.2144, found: 334.2145; EI-MS: *m/z* (rel. int.

%) : 334 [M⁺] (16), 301 (25), 291 (97), 271 (15), 245 (83), 227 (53), 221 (95), 177 (33),
175 (100), 149 (45), 133 (55), 121 (42), 109 (46), 105 (55), 91 (60), 81 (37), 69 (49).