

Article

Antiprotozoal Nor-Triterpene Alkaloids from *Buxus sempervirens* L.

Lara U. Szabó ¹, Marcel Kaiser ^{2,3}, Pascal Mäser ^{2,3} and Thomas J. Schmidt ^{1,*}

¹ Institute of Pharmaceutical Biology and Phytochemistry (IPBP), University of Münster, Pharma Campus Corrensstraße 48, D-48149 Münster, Germany; lszabo@uni-muenster.de

² Swiss Tropical and Public Health Institute (Swiss TPH), Socinstrasse 57, CH-4051 Basel, Switzerland; marcel.kaiser@unibas.ch (M.K.); pascal.maeser@swisstph.ch (P.M.)

³ University of Basel, Petersplatz 1, CH-4003 Basel, Switzerland

* Correspondence: thomschm@uni-muenster.de; Tel.: +49-251-83-33378

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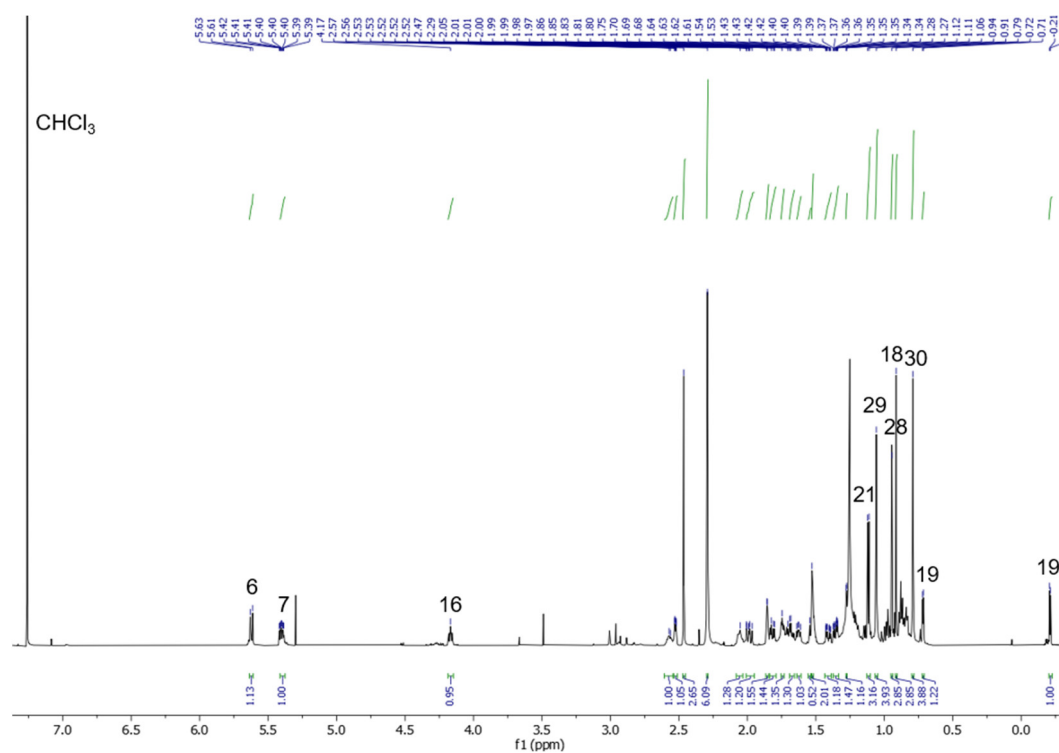


Figure S1. ^1H NMR spectrum of Cyclovirobuxine-B (**2**) (CDCl_3 , 600 MHz). The assignment of the signals between 1.275 and 2.6 ppm can be found in the enlarged Figure S2.

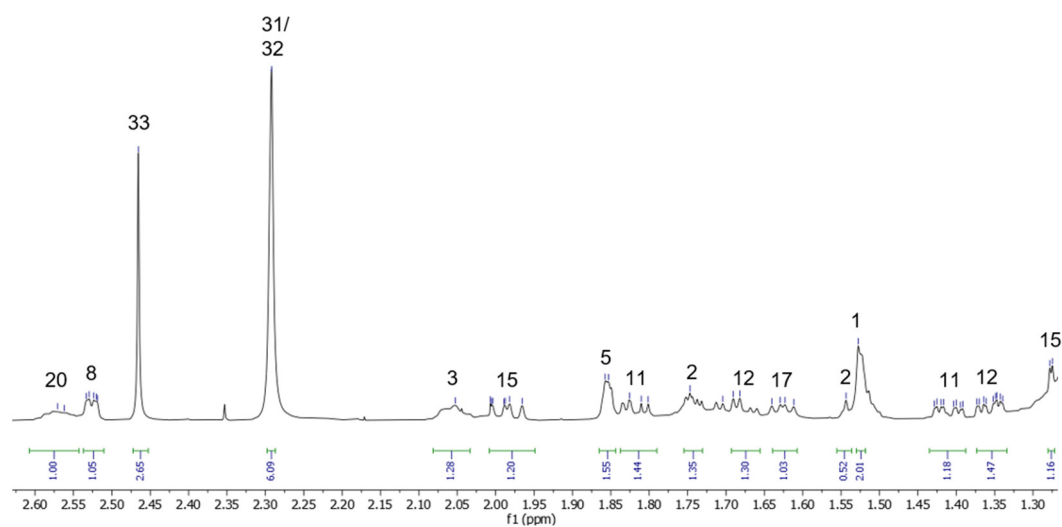


Figure S2. Detail of the ^1H NMR spectrum of Cyclovirobuxine-B (**2**) (CDCl_3 , 600 MHz).

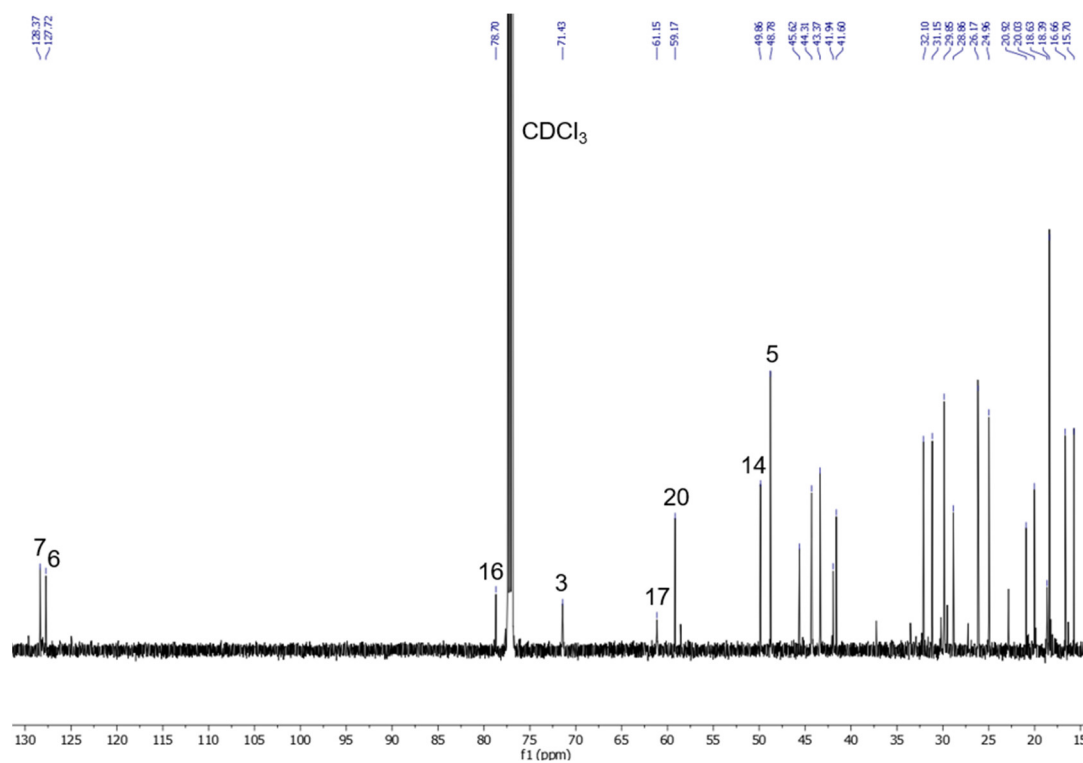


Figure S3. ^{13}C NMR spectrum of Cyclovirobuxine-B (**2**) (CDCl_3 , 150 MHz). The assignment of the signals between 15 and 46 ppm can be found in the enlarged Figure S4.

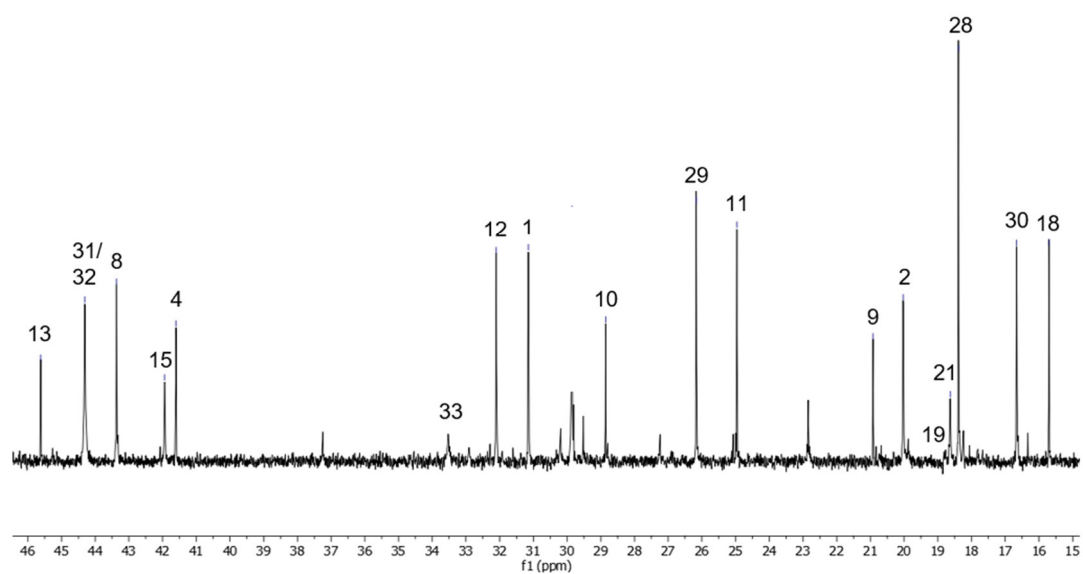


Figure S4. Detail of the ^{13}C NMR spectrum of Cyclovirobuxine-B (**2**) (CDCl_3 , 150 MHz).

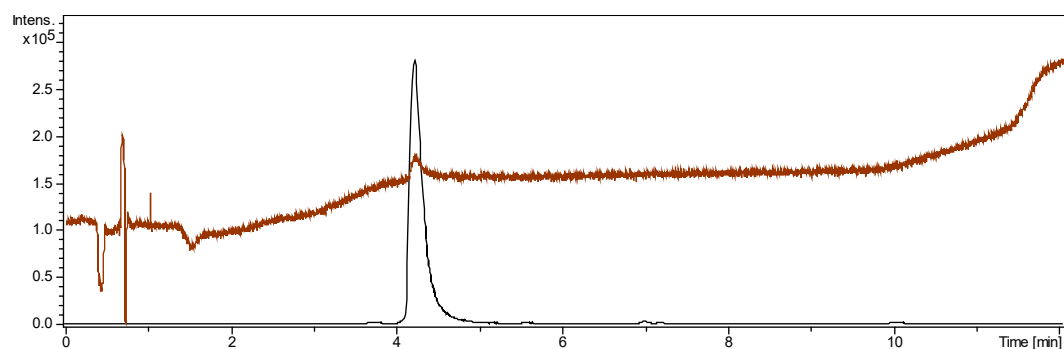


Figure S5. UHPLC/ESI-QqTOF-MS/MS chromatogram of O-tigloylcyclomicrophylline-B (3). Base peak chromatogram 200.0000-1000.0000 +All MS (black); UV-Chromatogram, 200-400 nm (red).

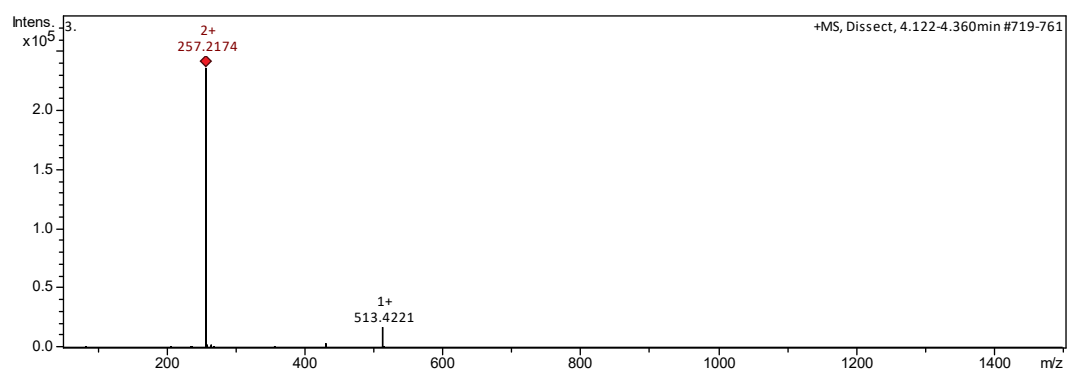


Figure S6. +ESI-QqTOF MS spectrum of O-tigloylcyclomicrophylline-B (3); m/z 257.2174 $[M+2H]^{2+}$ and 513.4221 $[M+H]^+$.

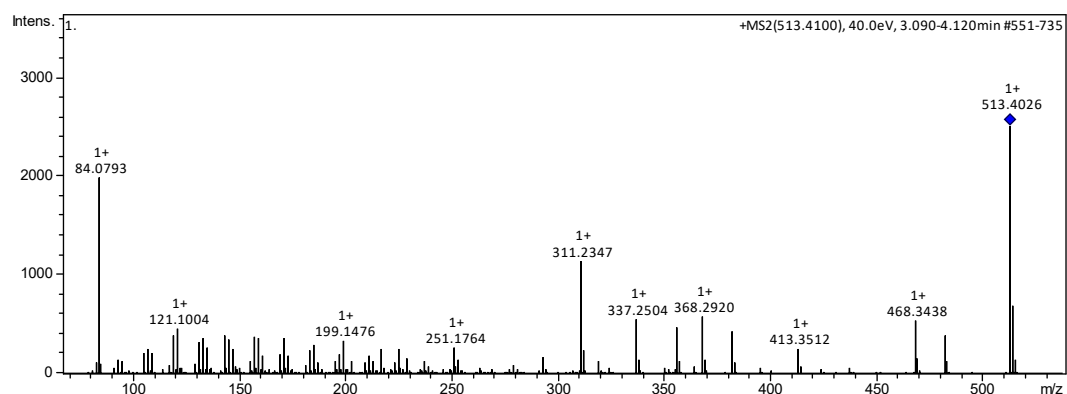


Figure S7. +ESI-QqTOF MS/MS spectrum of O-tigloylcyclomicrophylline-B (3).

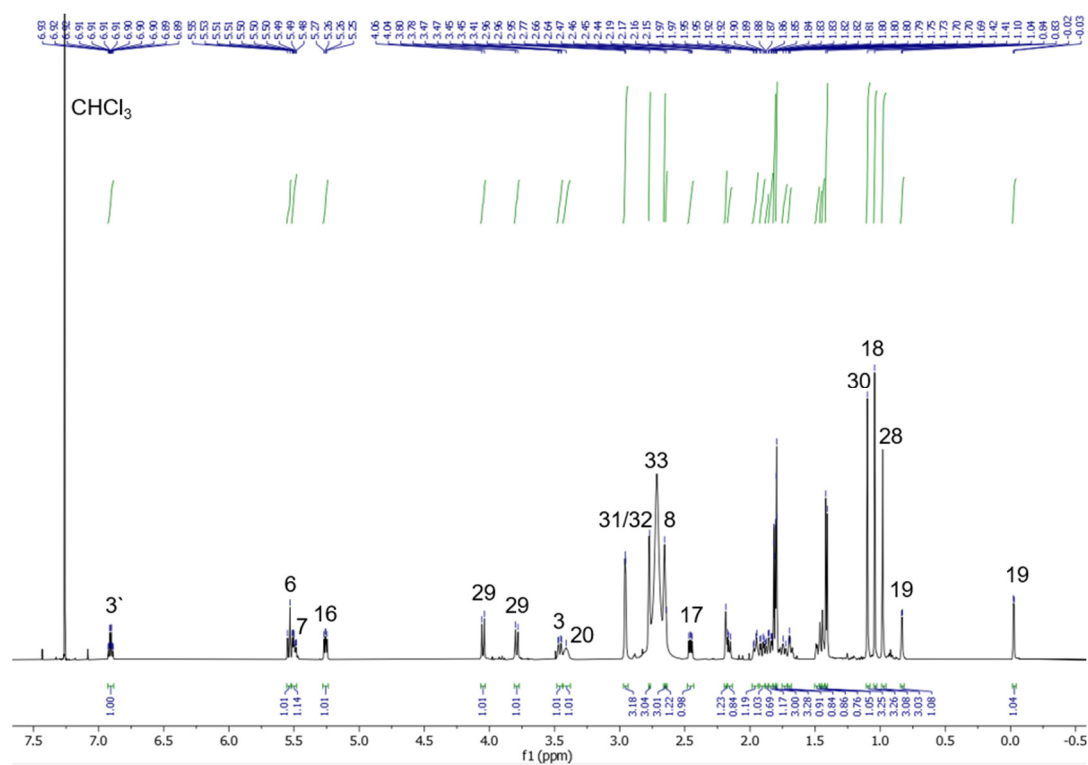


Figure S8. ^1H NMR spectrum of O-tigloylcyclomicrophylline-B (**3**) (CDCl_3 , 600 MHz). The assignment of the signals between 1.35 and 2.25 ppm can be found in the enlarged Figure S9.

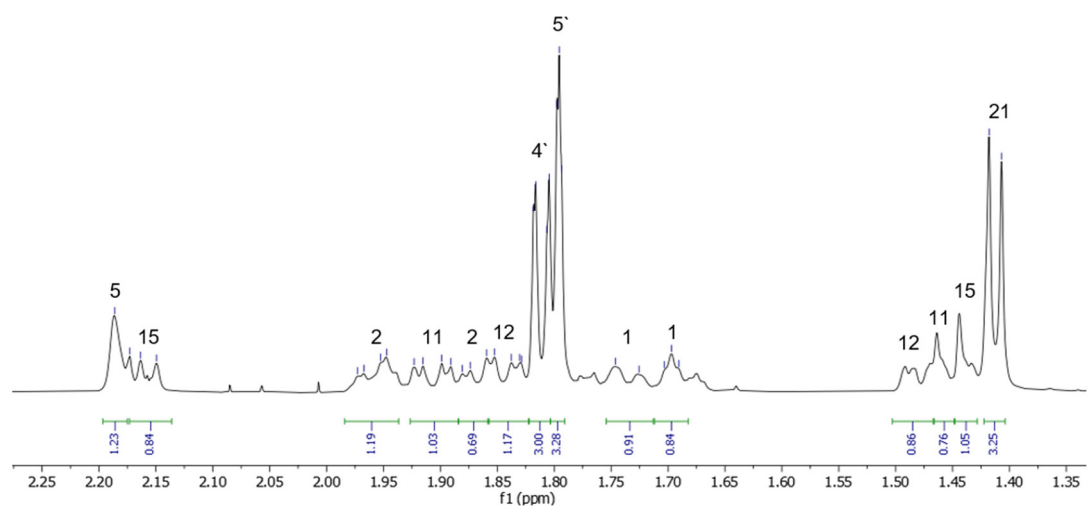


Figure S9. Detail of the ^1H NMR spectrum of O-tigloylcyclomicrophylline-B (**3**) (CDCl_3 , 600 MHz).

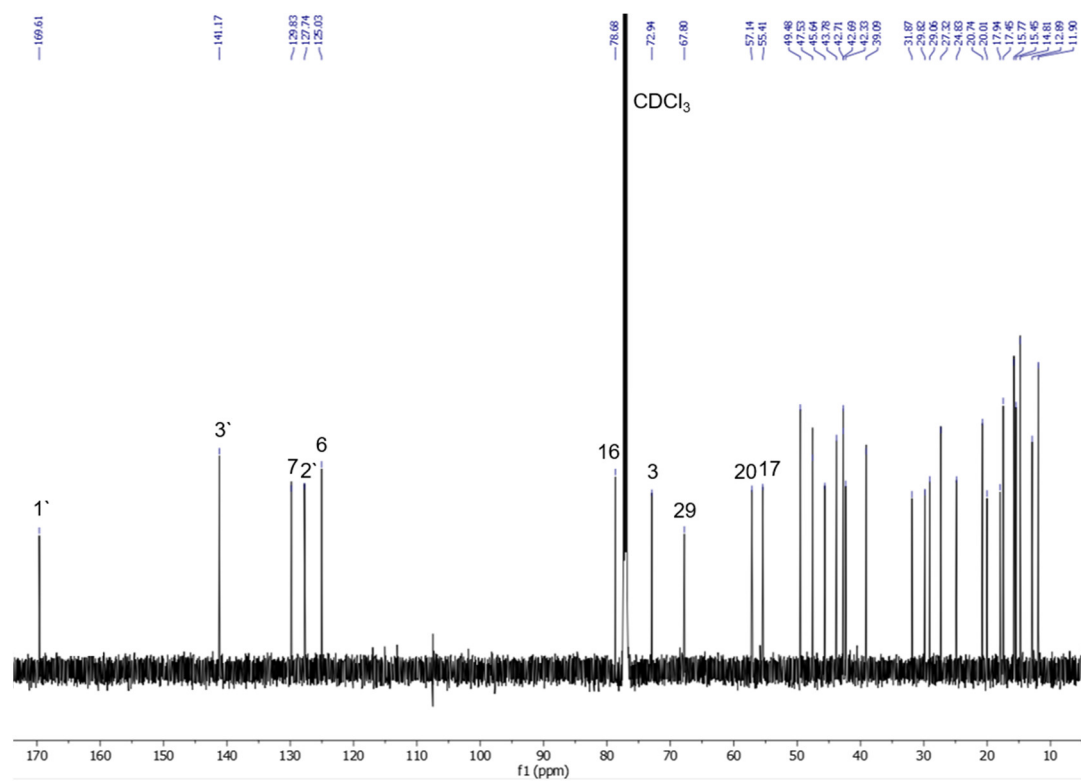


Figure S10. ^{13}C NMR spectrum of O-tigloylcyclomicrophylline-B (3) (CDCl_3 , 150 MHz). The assignment of the signals between 10 and 50 ppm can be found in the enlarged Figure S11.

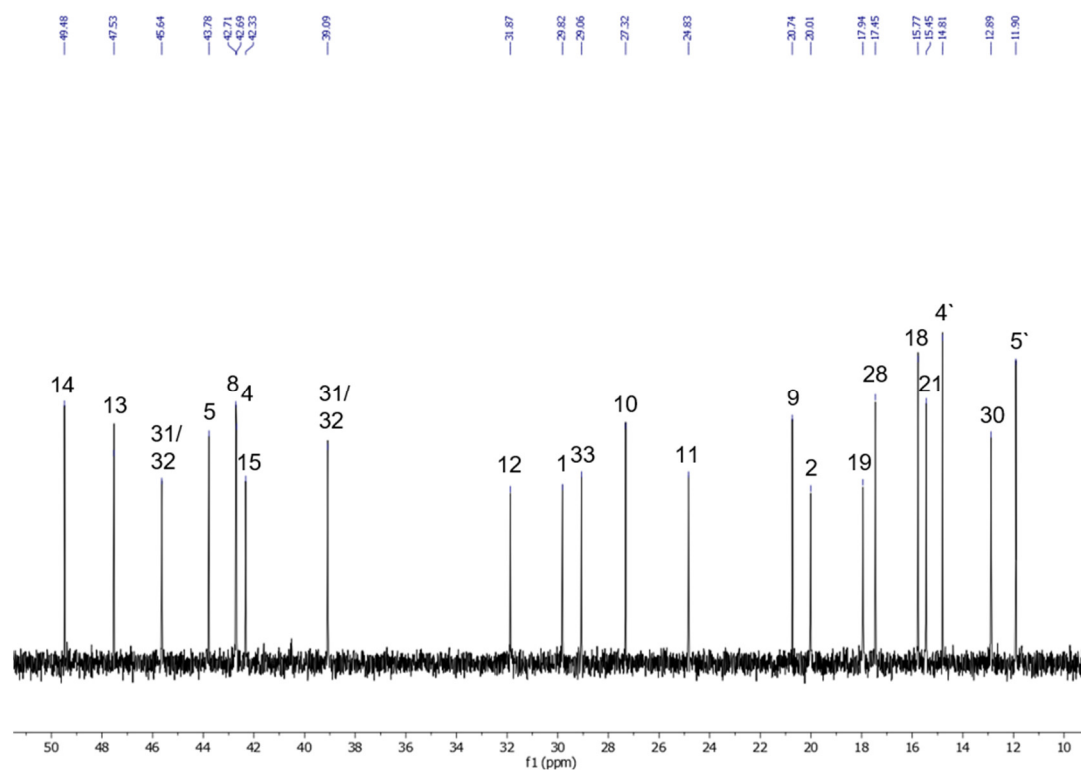


Figure S11. Detail of the ^{13}C NMR spectrum of O-tigloylcyclomicrophylline-B (3) (CDCl_3 , 150 MHz).

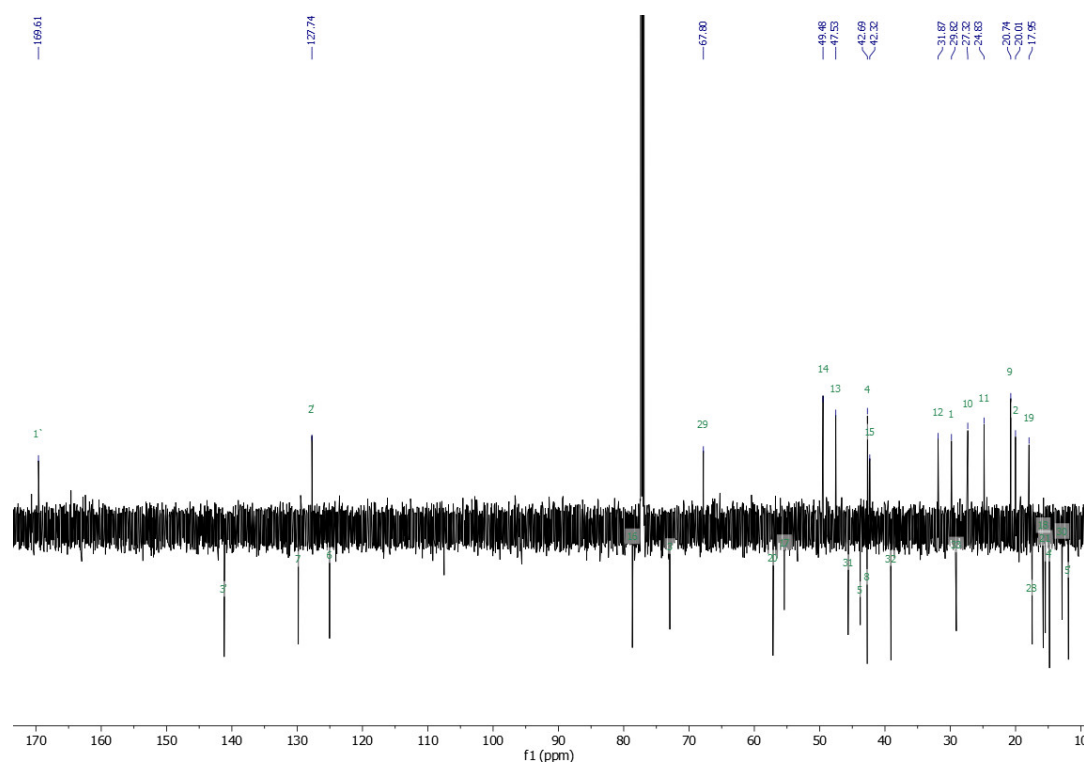


Figure S12. ^{13}C APT spectrum of O-tigloylcyclomicrophylline-B (3) (CDCl_3 , 150 MHz).

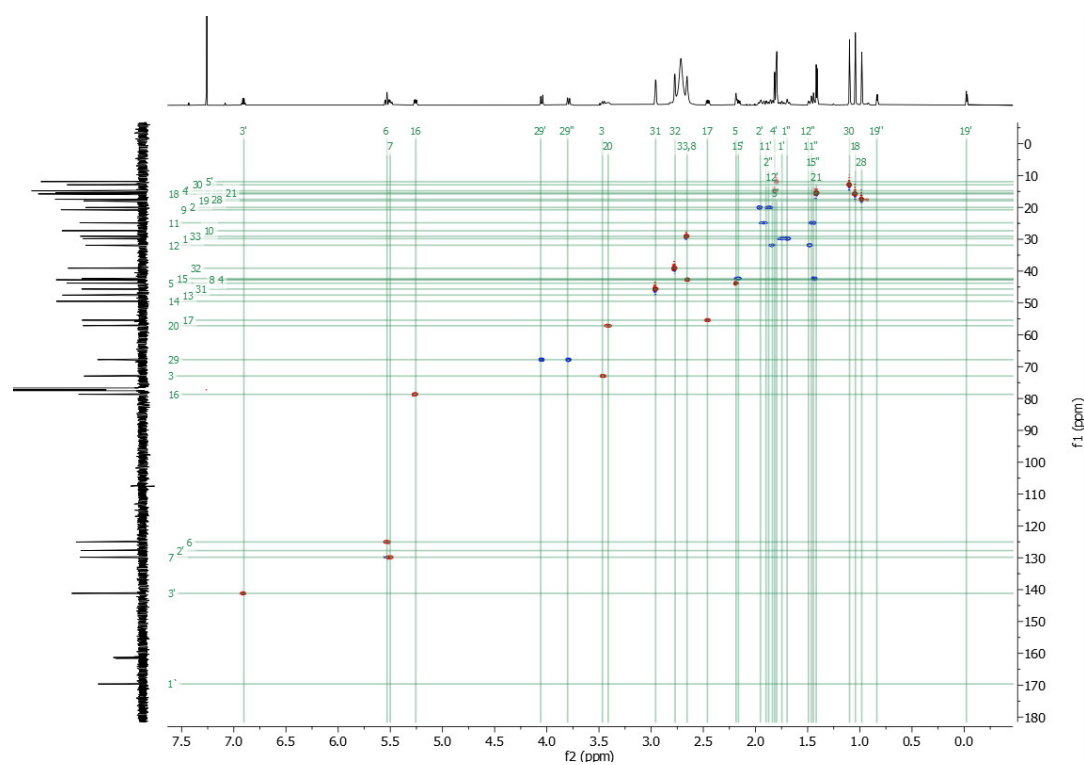


Figure S13. $^1\text{H}/^{13}\text{C}$ HSQC spectrum of O-tigloylcyclomicrophylline-B (3) (CDCl_3 , 600/150 MHz).

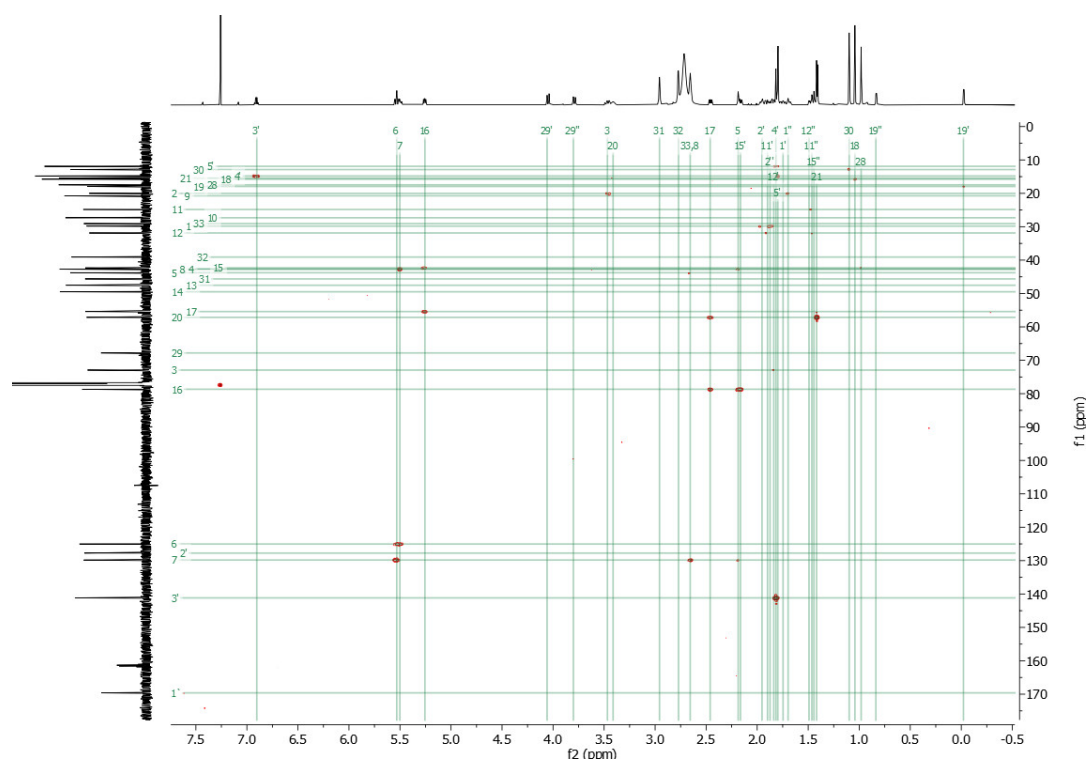


Figure S14. $^1\text{H}/^{13}\text{C}$ H2BC spectrum of O-tigloylcyclomicrophylline-B (3) (CDCl_3 , 600/150 MHz).

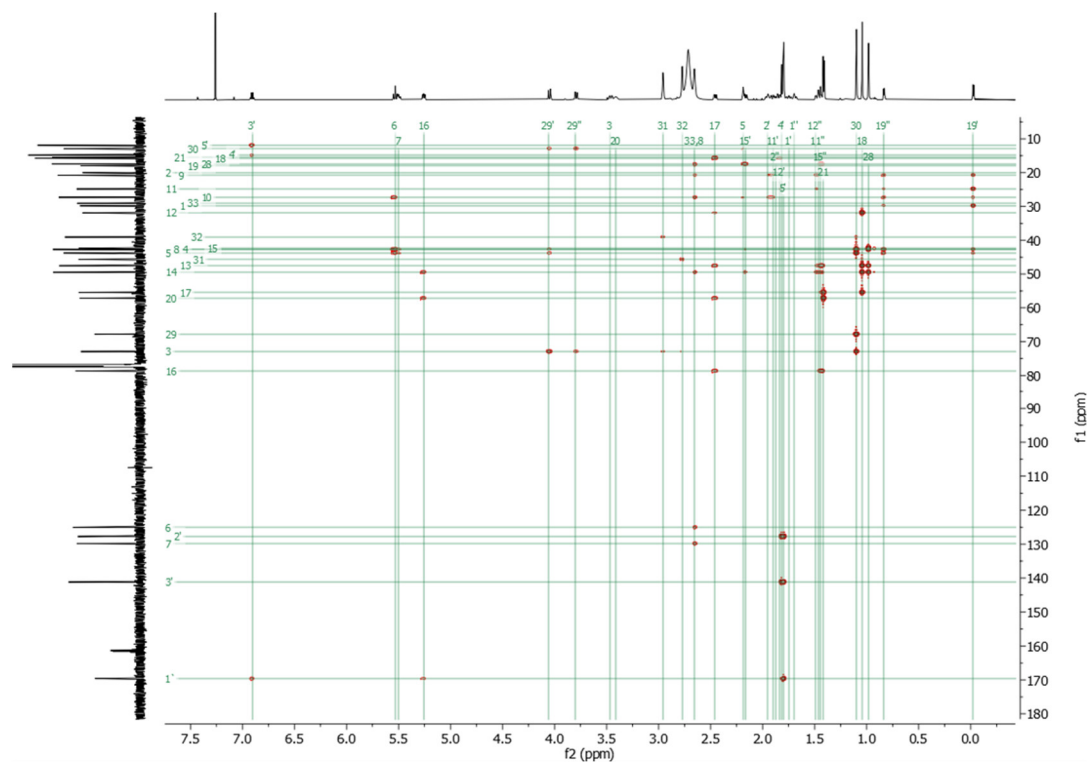
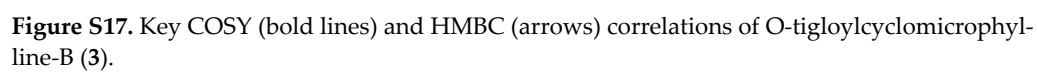


Figure S15. $^1\text{H}/^{13}\text{C}$ HMBC spectrum of O-tigloylcyclomicrophylline-B (3) (CDCl_3 , 600/150 MHz).



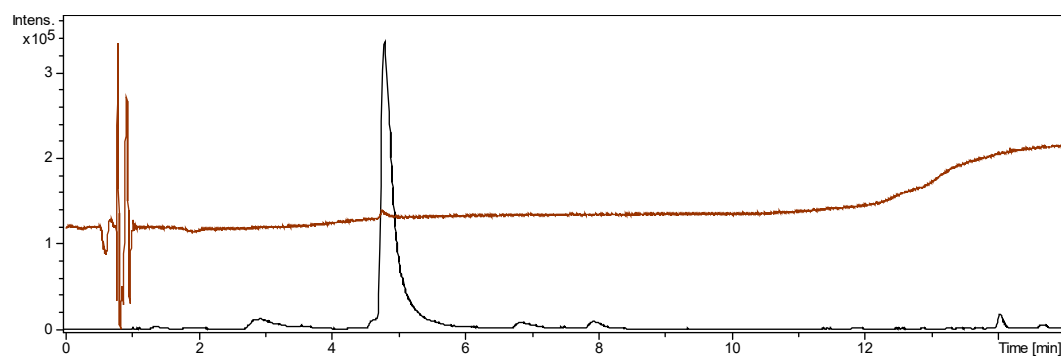


Figure S18. UHPLC/ESI-QqTOF-MS/MS chromatogram of O-tigloylcyclomicrophylline-A (**4**). Base peak chromatogram 200.0000-1000.0000 +All MS (black); UV-Chromatogram, 200-400 nm (red).

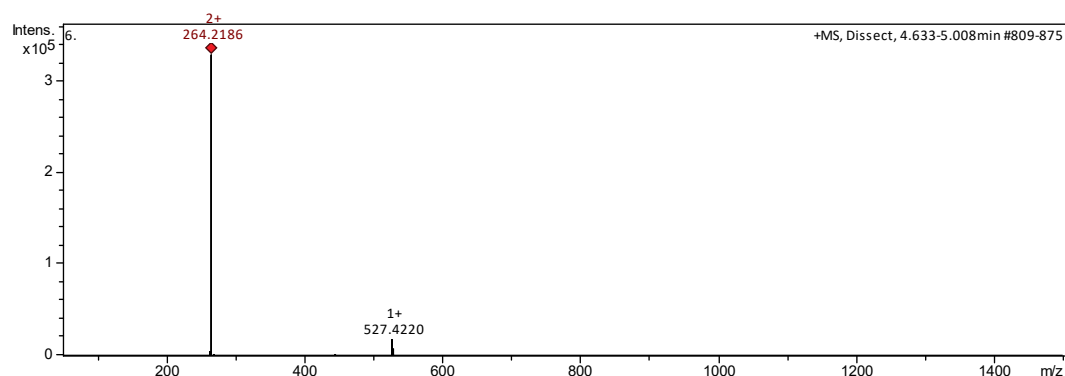


Figure S19. +ESI-QqTOF MS spectrum of O-tigloylcyclomicrophylline-A (**4**); m/z 264.2186 $[M+2H]^{2+}$ and 527.4220 $[M+H]^+$.

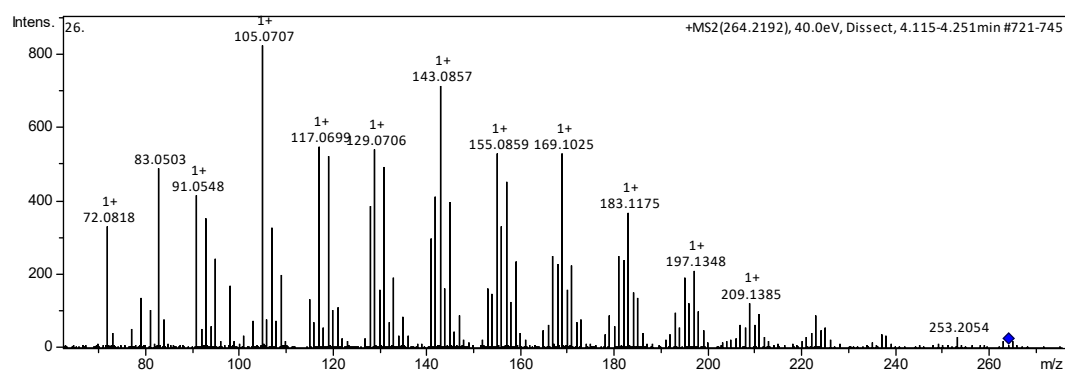


Figure S20. +ESI-QqTOF MS/MS spectrum of O-tigloylcyclomicrophylline-A (**4**).

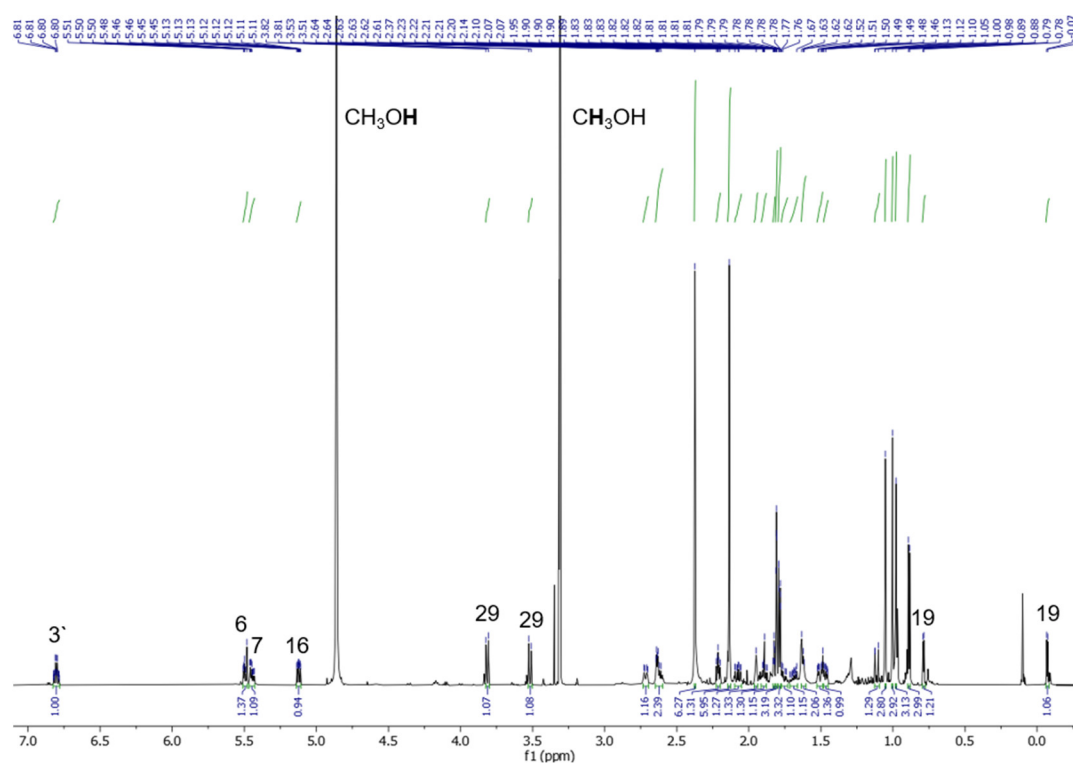


Figure S21. ^1H NMR spectrum of O-tigloylcyclocimicrophylline-A (4) (CD_3OD , 600 MHz). The assignment of the signals between 0.85 and 2.8 ppm can be found in the enlarged Figure S22.

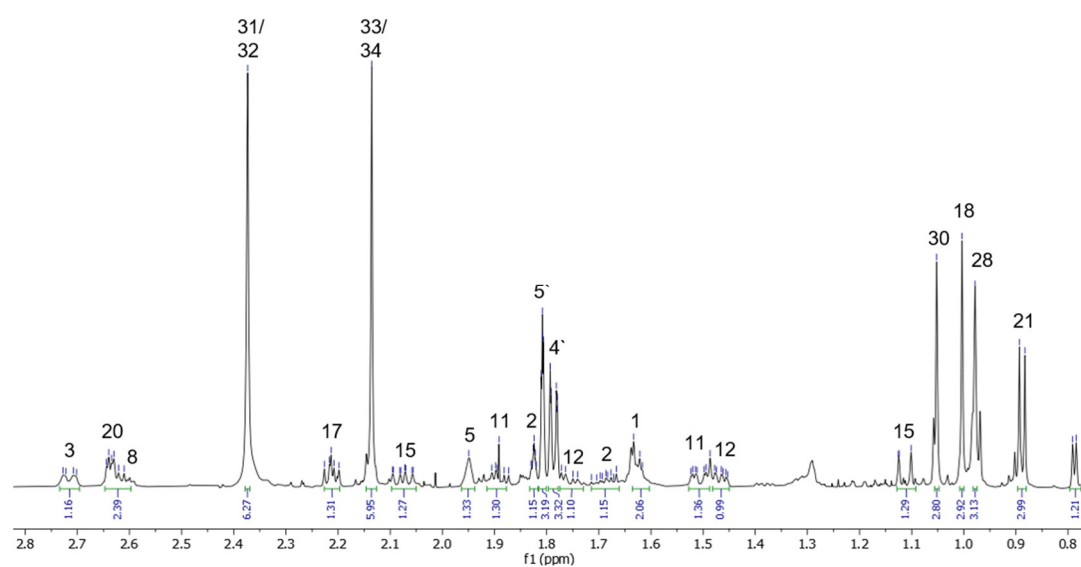


Figure S22. Detail of the ^1H NMR spectrum of O-tigloylcyclocimicrophylline-A (4) (CD_3OD , 600 MHz).

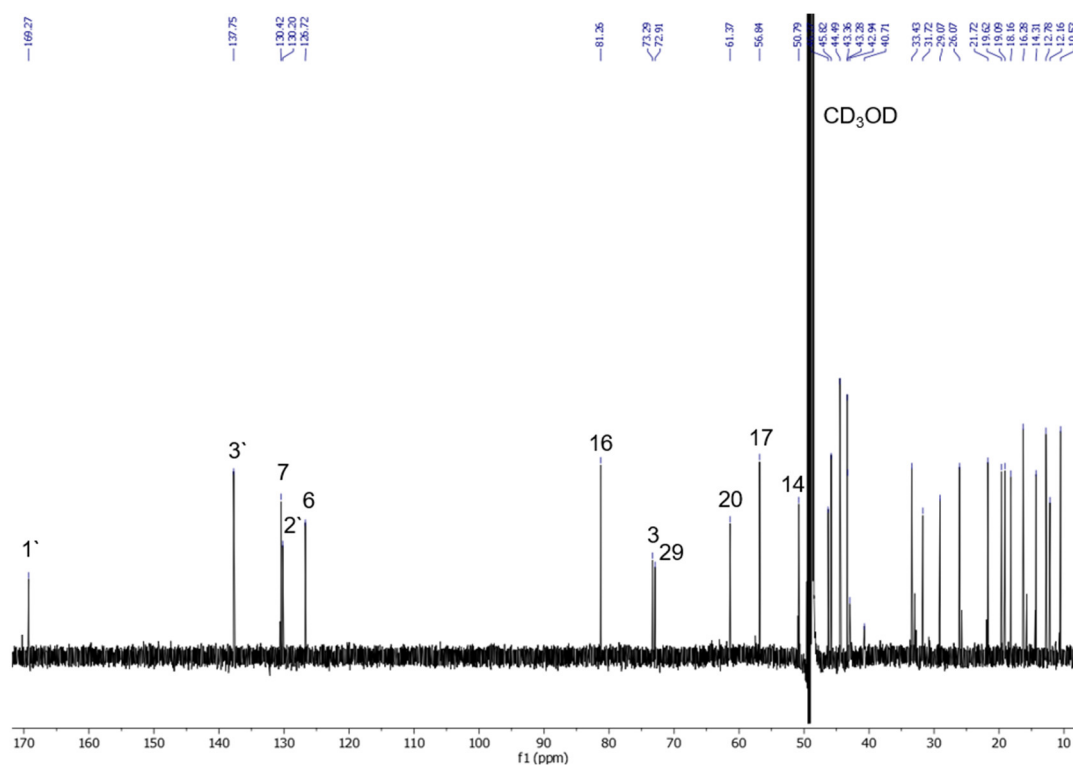


Figure S23. ^{13}C NMR spectrum of O-tigloylcyclomicrophylline-A (4) (CD_3OD , 150 MHz). The assignment of the signals between 10 and 47 ppm can be found in the enlarged Figure S24.

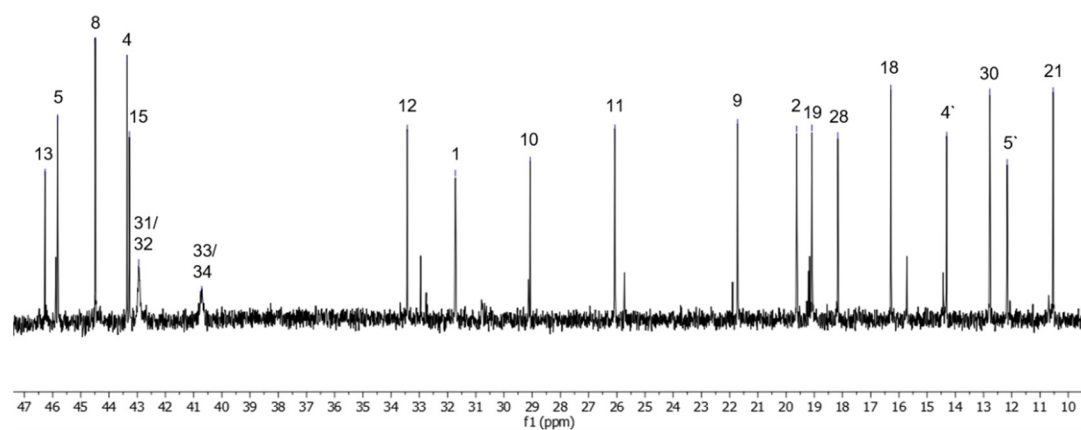


Figure S24. Detail of the ^{13}C NMR spectrum of O-tigloylcyclomicrophylline-A (4) (CD_3OD , 150 MHz).

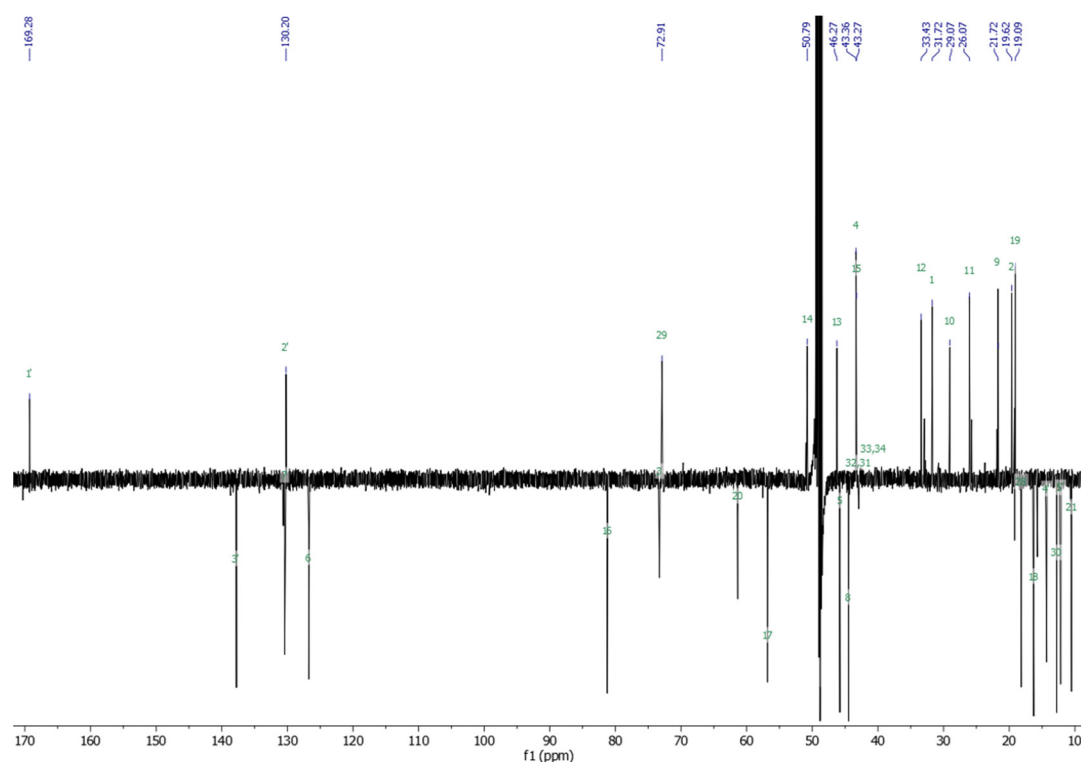


Figure S25. ^{13}C APT spectrum of O-tigloylcyclomicrophylline-A (**4**) (CD_3OD , 150 MHz).

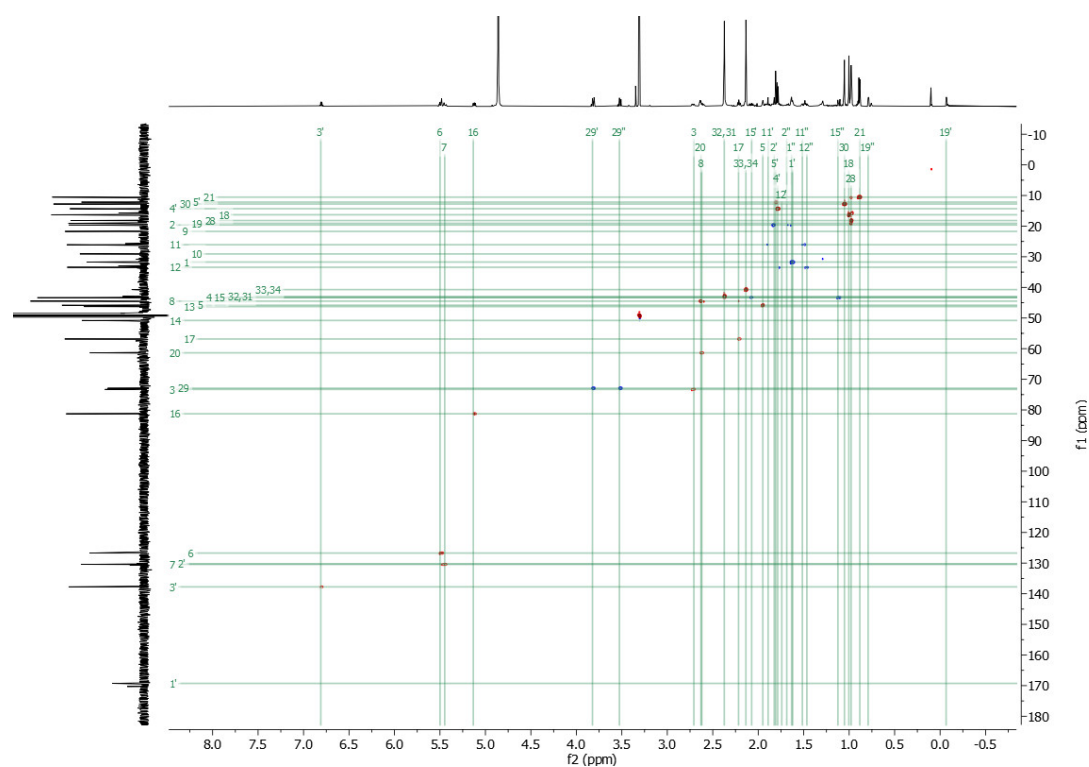


Figure S26. $^1\text{H}/^{13}\text{C}$ HSQC spectrum of O-tigloylcyclomicrophylline-A (**4**) (CD_3OD , 600/150 MHz).

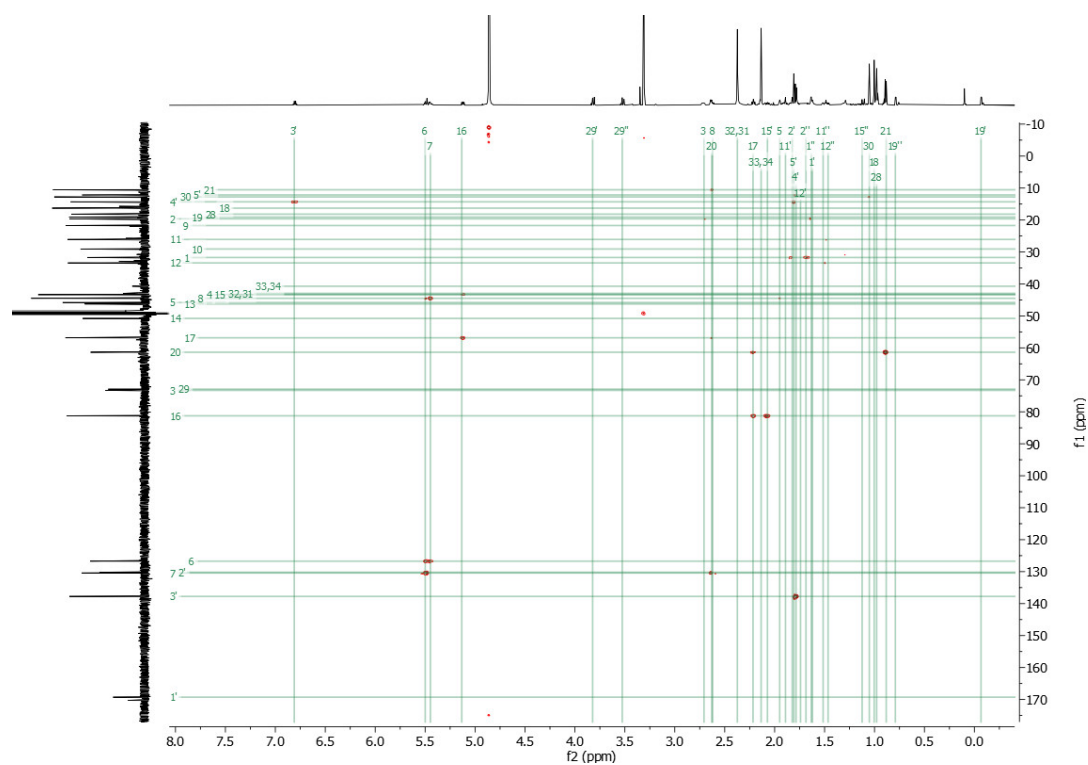


Figure S27. $^1\text{H}/^{13}\text{C}$ H2BC spectrum of O-tigloylcyclomicrophylline-A (4) (CD_3OD , 600/150 MHz).

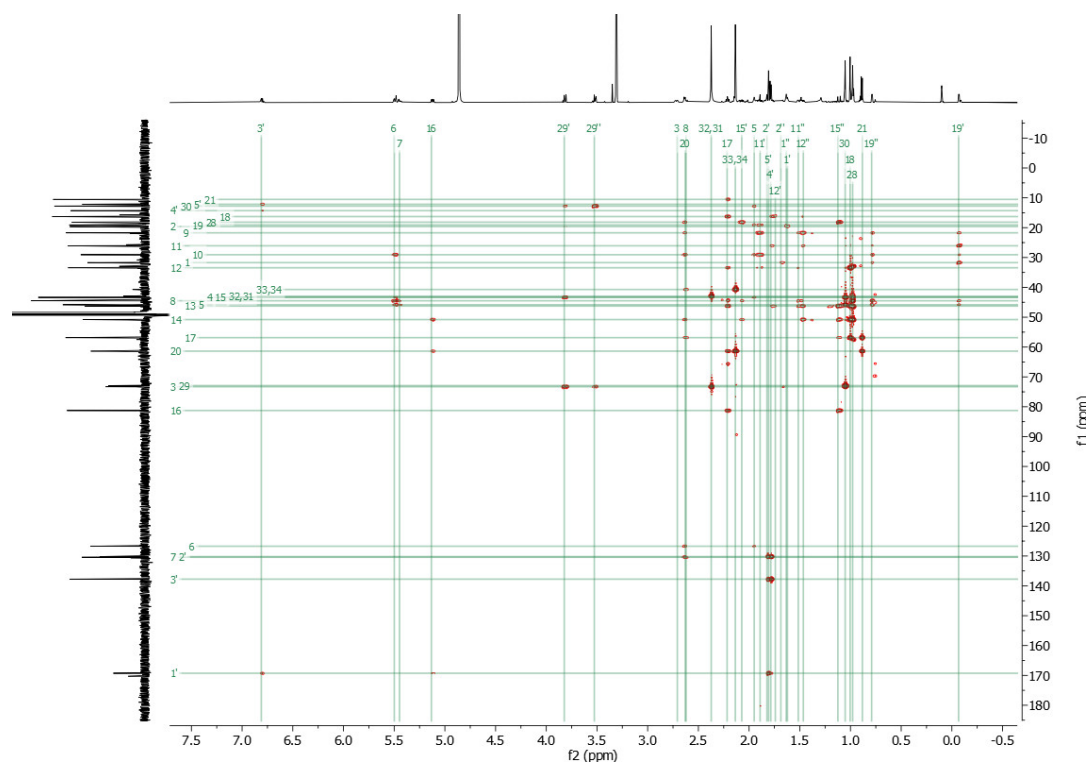


Figure S28. $^1\text{H}/^{13}\text{C}$ HMBC spectrum of O-tigloylcyclomicrophylline-A (4) (CD_3OD , 600/150 MHz).

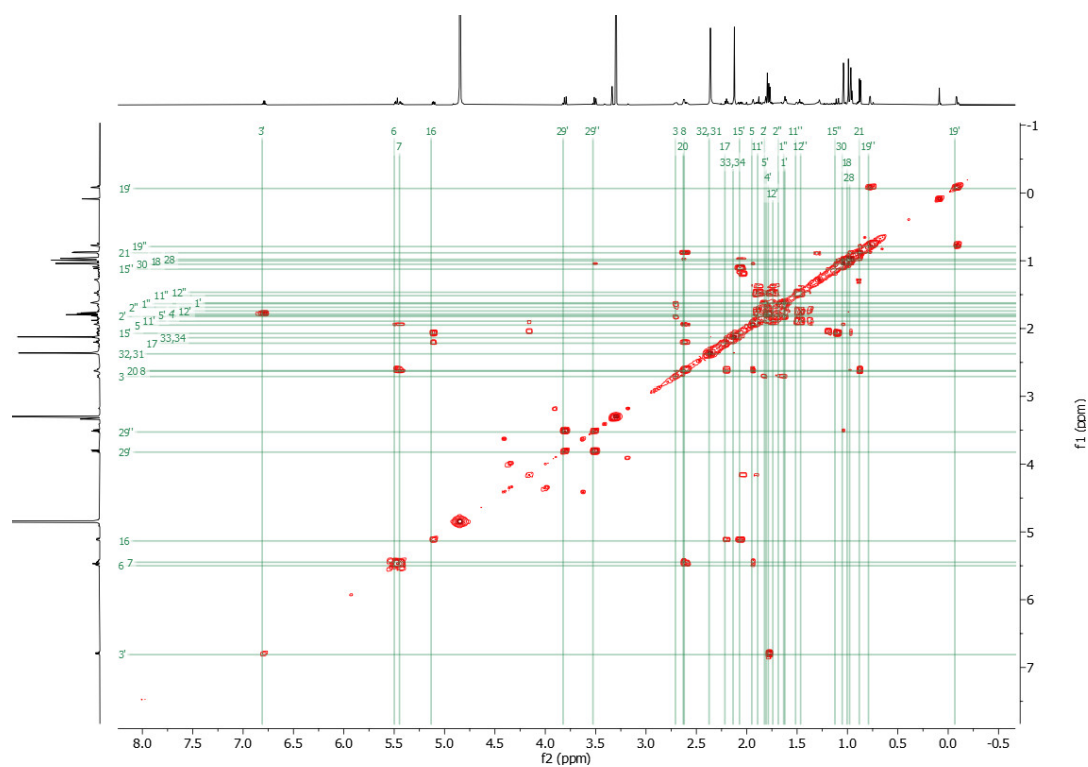


Figure S29. $^1\text{H}/^1\text{H}$ COSY spectrum of O-tigloylcyclomicrophylline-A (**4**) (CD_3OD , 600 MHz).

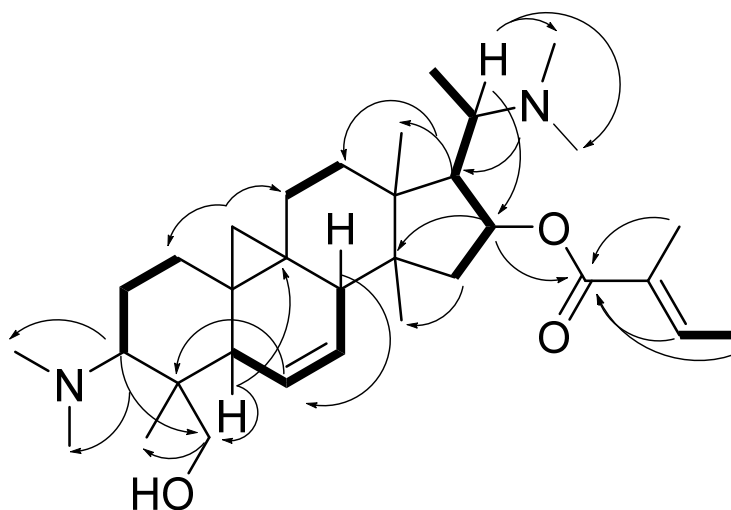


Figure S30. Key COSY (bold lines) and HMBC (arrows) correlations of O-tigloylcyclomicrophylline-A (**4**).

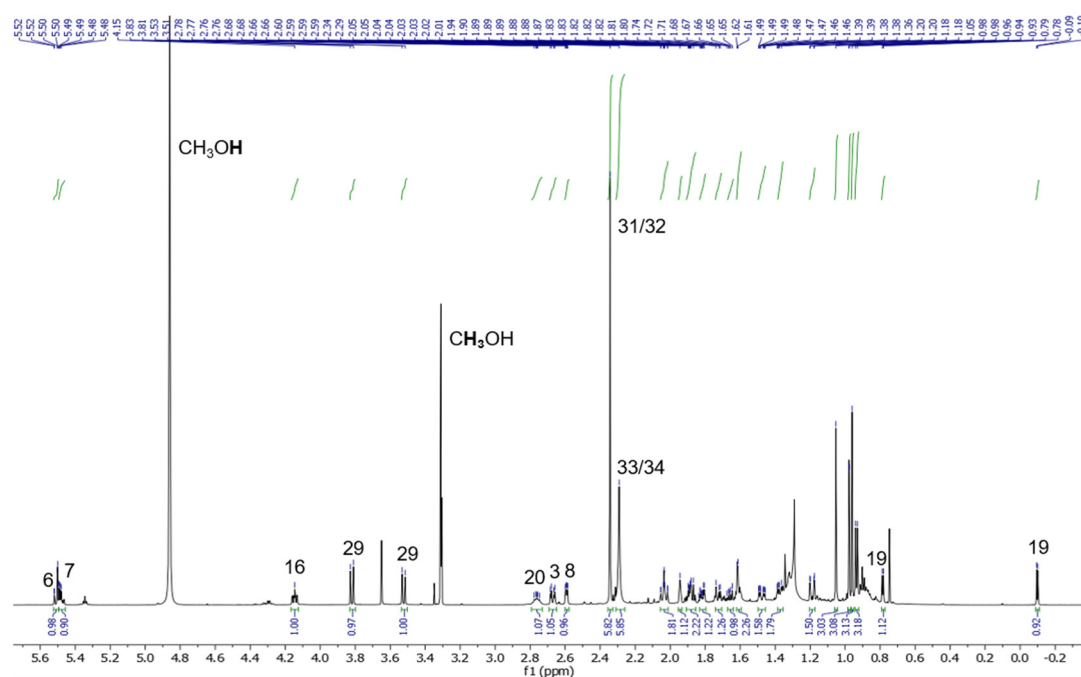


Figure S31. ^1H NMR spectrum of Cyclomicrophylline-A (5) (CD_3OD , 600 MHz). The assignment of the signals between 0.9 and 2.05 ppm can be found in the enlarged Figure S32.

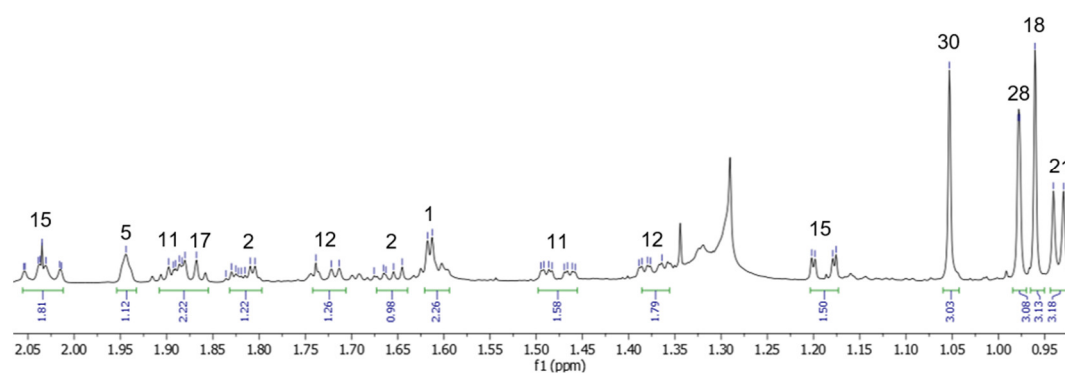


Figure S32. Detail of the ^1H NMR spectrum of Cyclomicrophylline-A (5) (CD_3OD , 600 MHz).

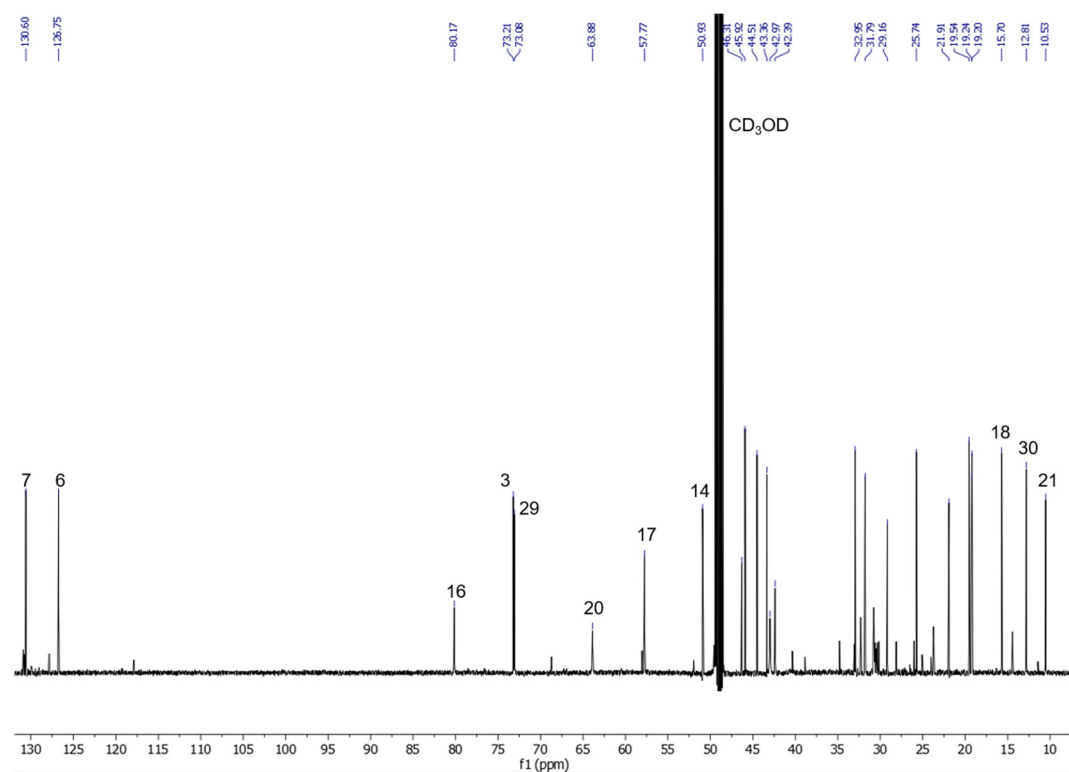


Figure S33. ^{13}C NMR spectrum of Cyclomicrophylline-A (5) (CD_3OD , 150 MHz). The assignment of the signals between 19 and 46.5 ppm can be found in the enlarged Figure S34.

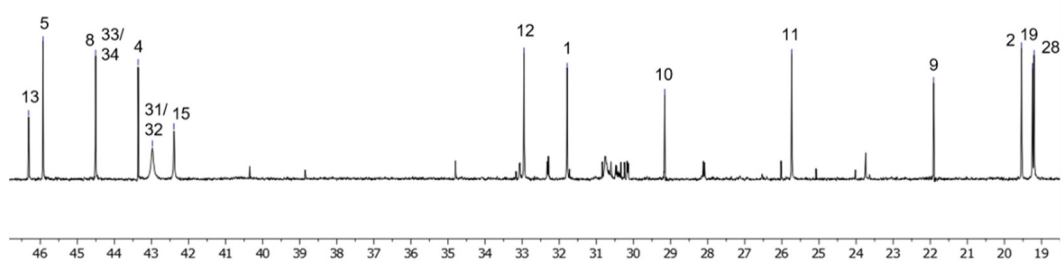


Figure S34. Detail of the ^{13}C NMR spectrum of Cyclomicrophylline-A (5) (CD_3OD , 150 MHz).

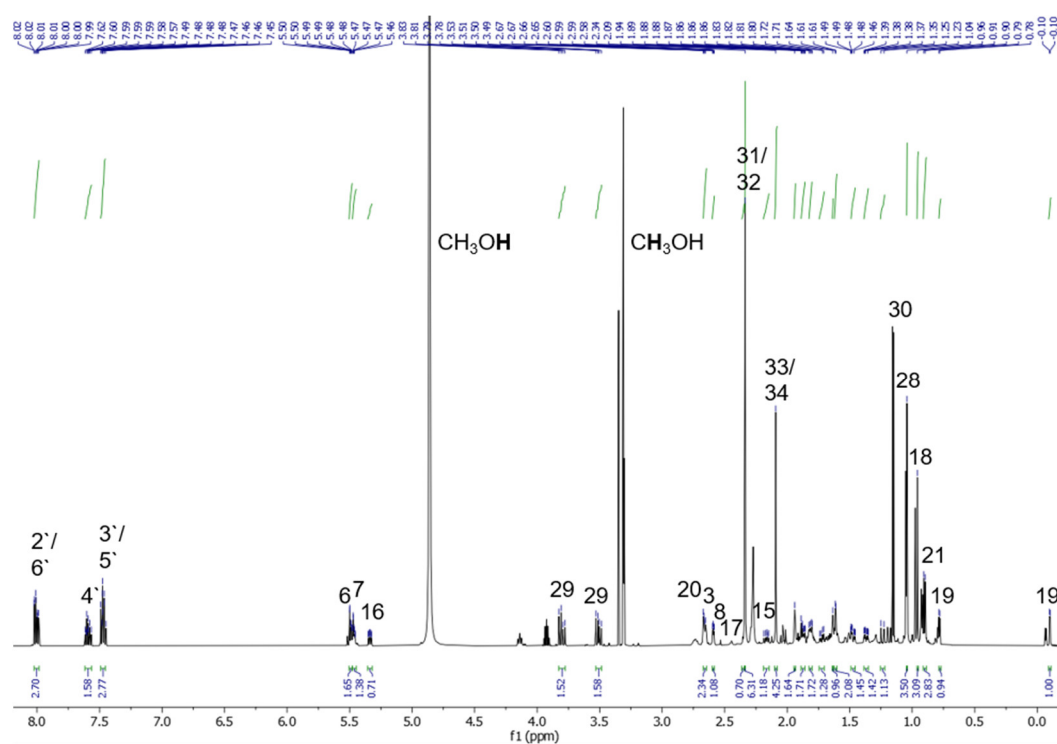


Figure S35. ^1H NMR spectrum of Cyclomicrophyllidine-A (**6**) (CD_3OD , 600 MHz). The assignment of the signals between 1.2 and 2.0 ppm can be found in the enlarged Figure S36.

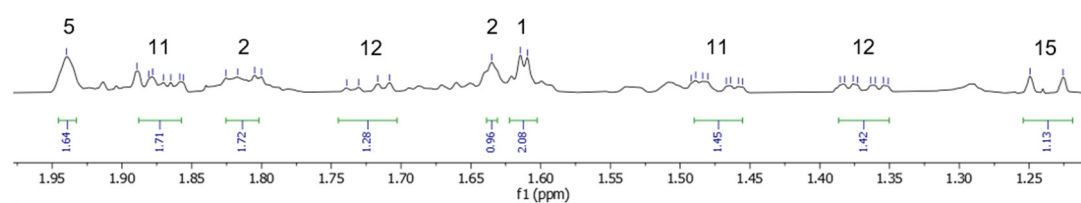


Figure S36. Detail of the ^1H NMR spectrum of Cyclomicrophyllidine-A (**6**) (CD_3OD , 600 MHz).

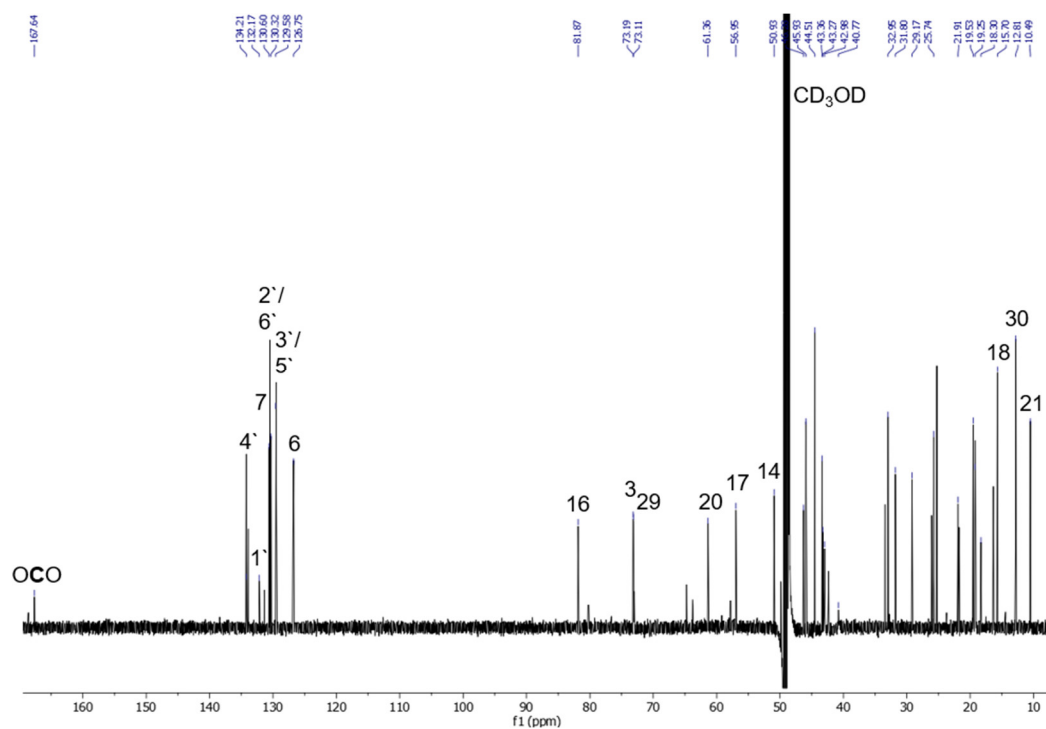


Figure S37. ¹³C NMR spectrum of Cyclomicrophyllidine-A (6) (CD₃OD, 150 MHz). The assignment of the signals between 18 and 47 ppm can be found in the enlarged Figure S38.

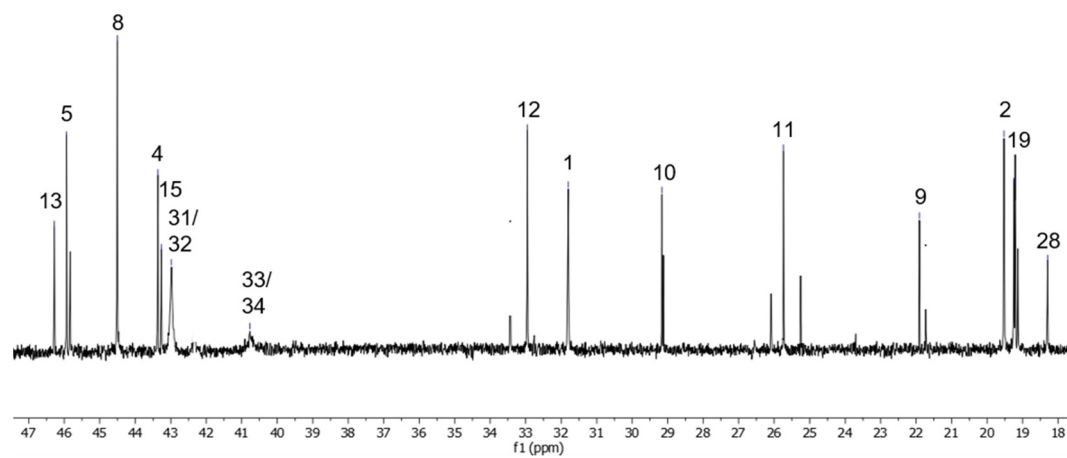


Figure S38. Detail of the ¹³C NMR spectrum of Cyclomicrophyllidine-A (6) (CD₃OD, 150 MHz).

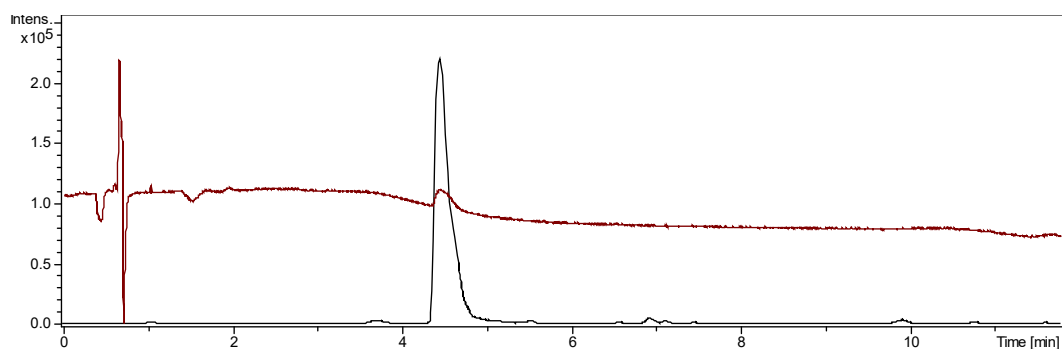


Figure S39. UHPLC/ESI-QqTOF-MS/MS chromatogram of Cyclomicrophyllidine-B (7). Base peak chromatogram 200.0000-1000.0000 +All MS (black); UV-Chromatogramm, 200-400 nm (red).

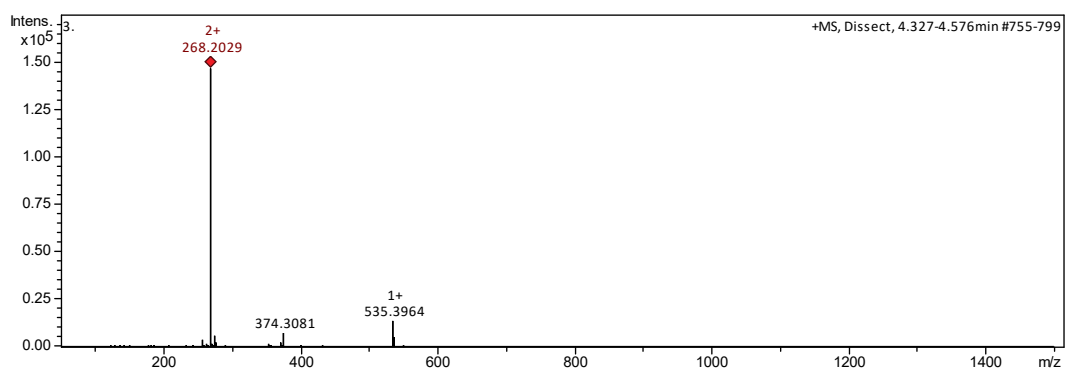


Figure S40. +ESI-QqTOF MS spectrum of Cyclomicrophyllidine-B (7); m/z 268.2029 $[M+2H]^{2+}$ and 535.3964 $[M+H]^+$.

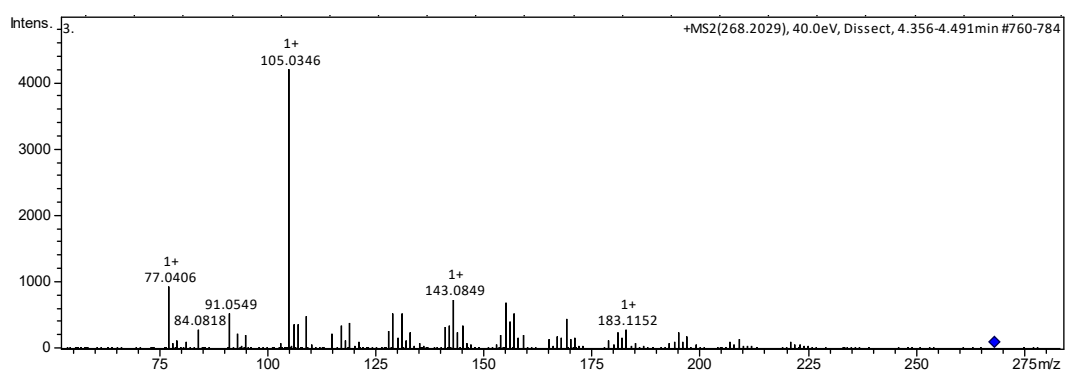


Figure S41. +ESI-QqTOF MS/MS spectrum of Cyclomicrophyllidine-B (7).

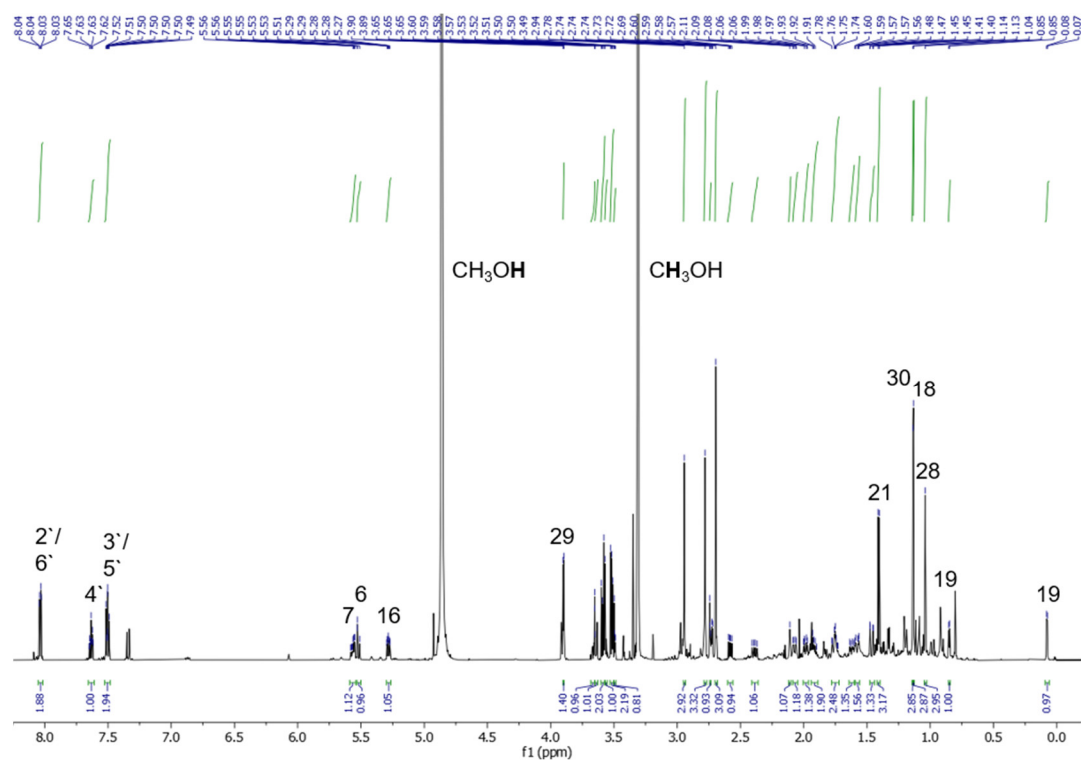


Figure S42. ^1H NMR spectrum of Cyclomicrophyllidine-B (7) (CD_3OD , 600 MHz). The assignment of the signals between 1.45 and 3.65 ppm can be found in the enlarged Figure S43.

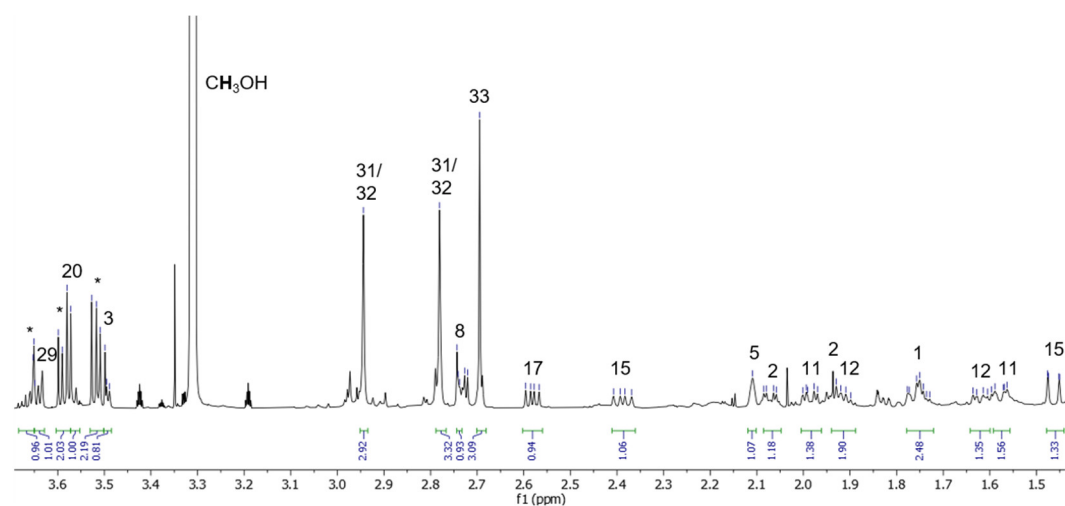


Figure S43. Detail of the ^1H NMR spectrum of Cyclomicrophyllidine-B (7) (CD_3OD , 600 MHz) (*signals of 9.4% glycerol).

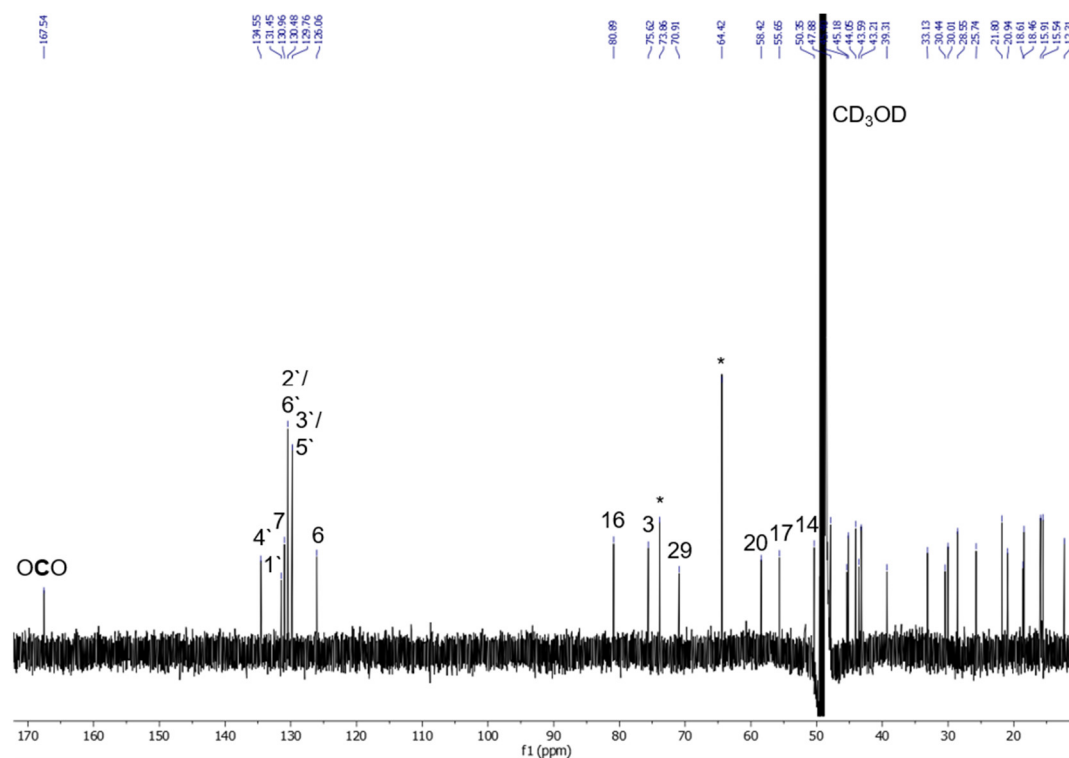


Figure S44. ¹³C NMR spectrum of Cyclomicrophyllidine-B (7) (CD₃OD, 150 MHz). The assignment of the signals between 11 and 48 ppm can be found in the enlarged Figure S45 (*signals of 9.4% glycerol).

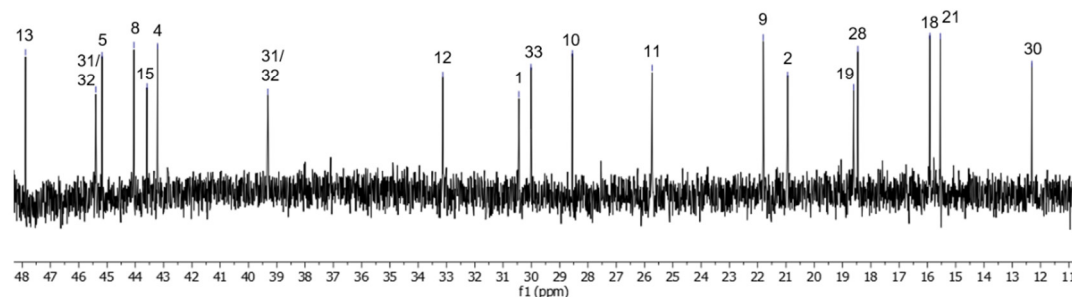


Figure S45. Detail of the ¹³C NMR spectrum of Cyclomicrophyllidine-B (7) (CD₃OD, 150 MHz).

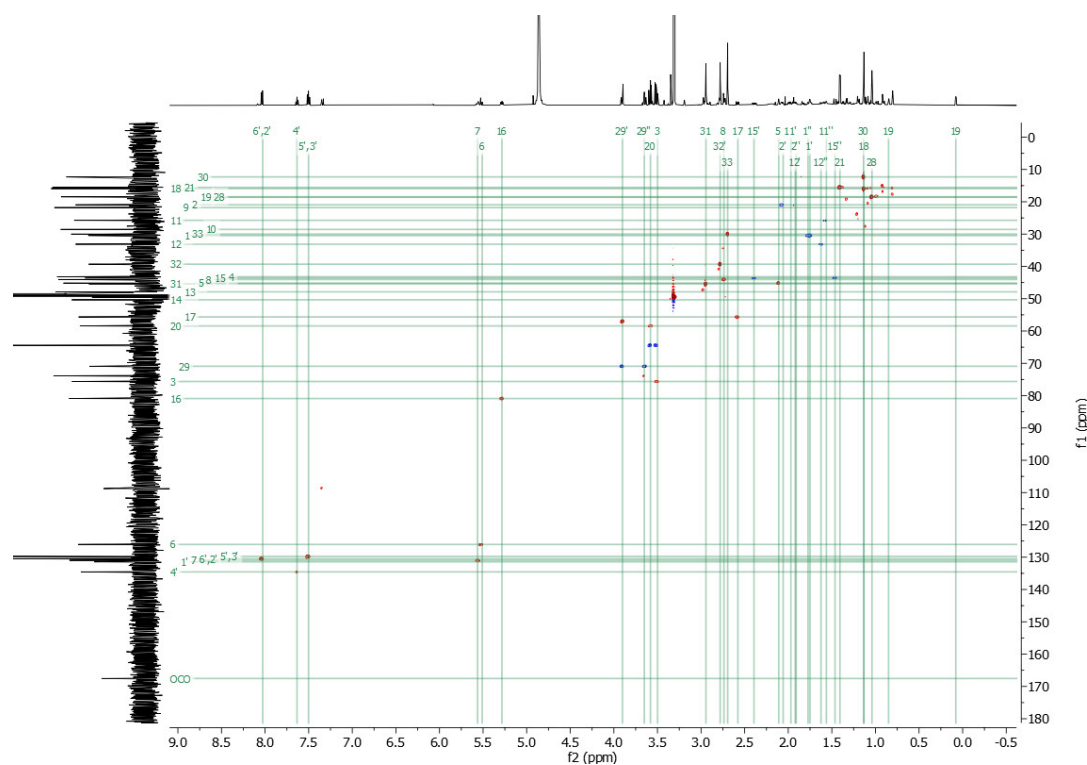


Figure S46. $^1\text{H}/^{13}\text{C}$ HSQC spectrum of Cyclomicrophyllidine-B (7) (CD_3OD , 600/150 MHz).

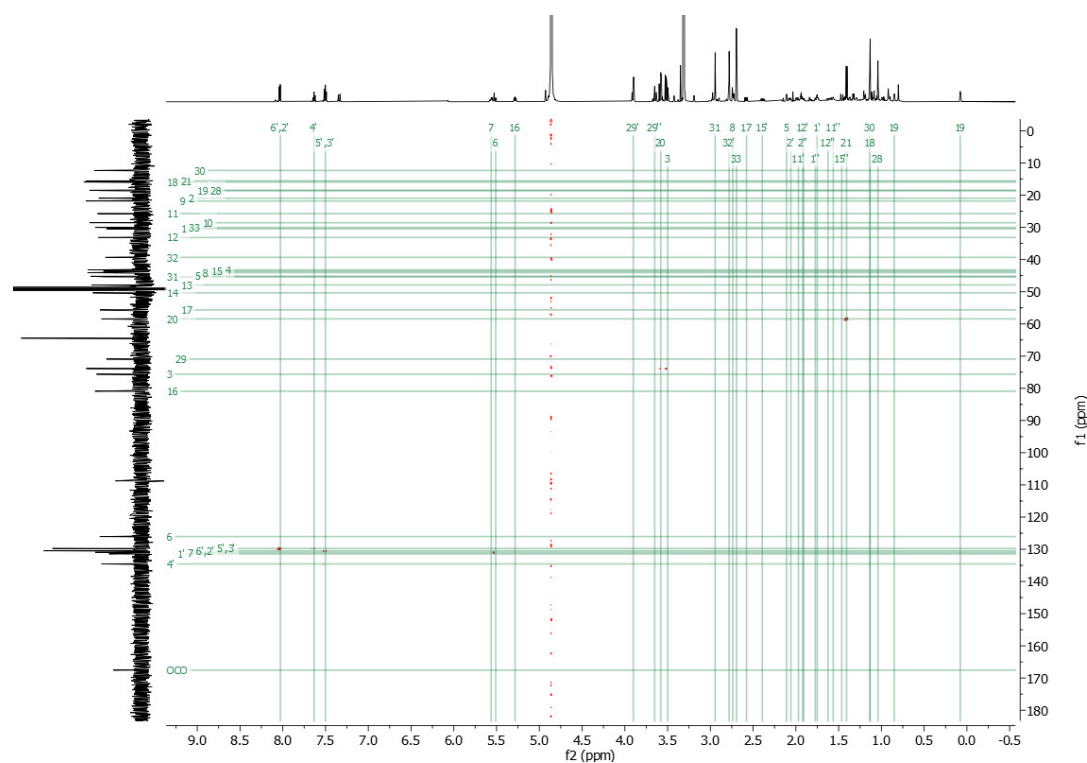


Figure S47. $^1\text{H}/^{13}\text{C}$ H2BC spectrum of Cyclomicrophyllidine-B (7) (CD_3OD , 600/150 MHz).

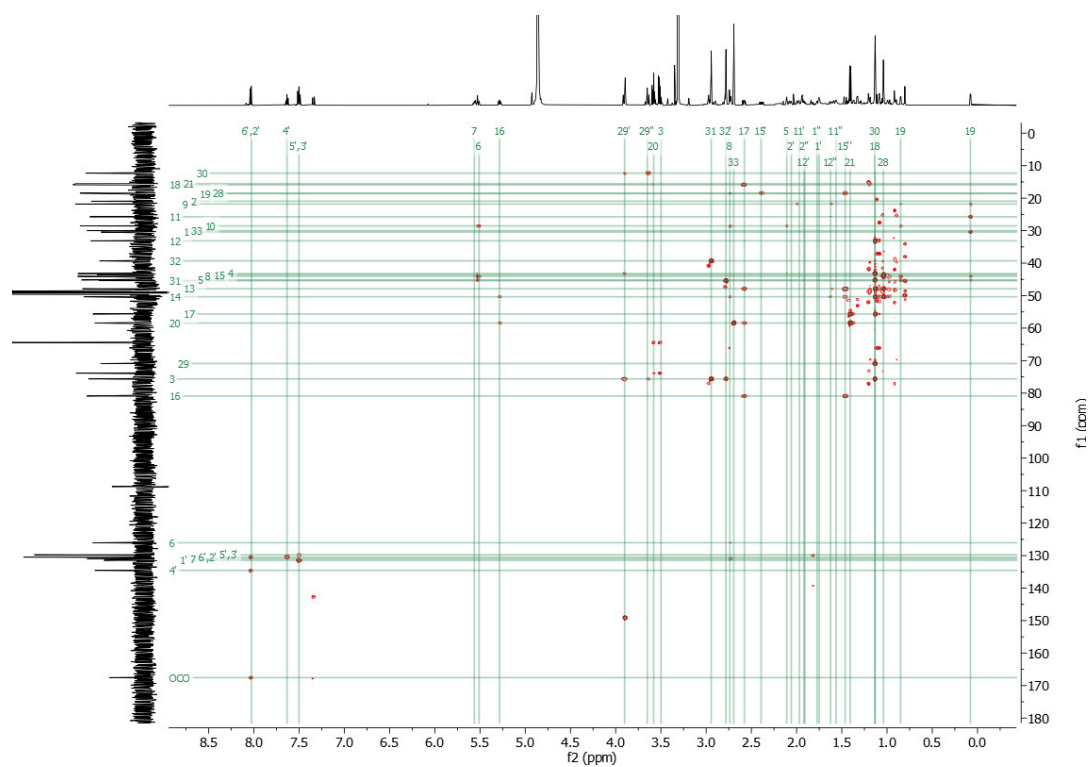


Figure S48. $^1\text{H}/^{13}\text{C}$ HMBC spectrum of Cyclomicrophyllidine-B (7) (CD_3OD , 600/150 MHz).

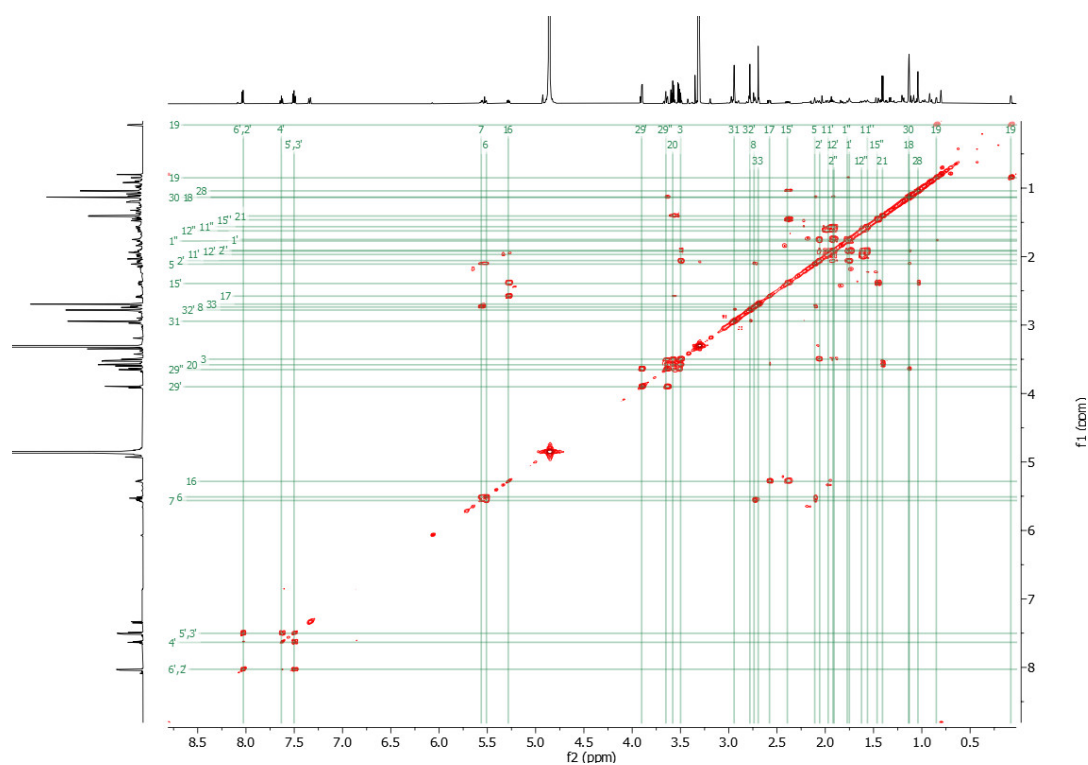


Figure S49. $^1\text{H}/^1\text{H}$ COSY spectrum of Cyclomicrophyllidine-B (7) (CD_3OD , 600 MHz).

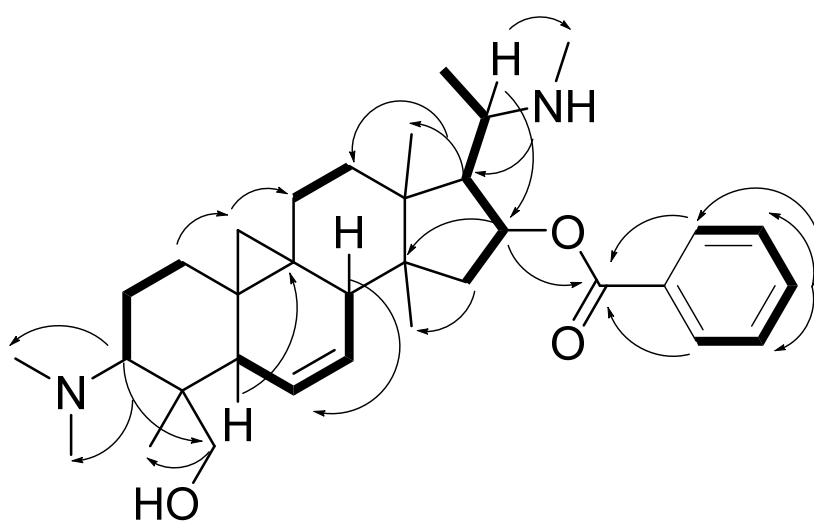


Figure S50. Key COSY (bold lines) and HMBC (arrows) correlations of Cycломicrophyllidine-B (7).

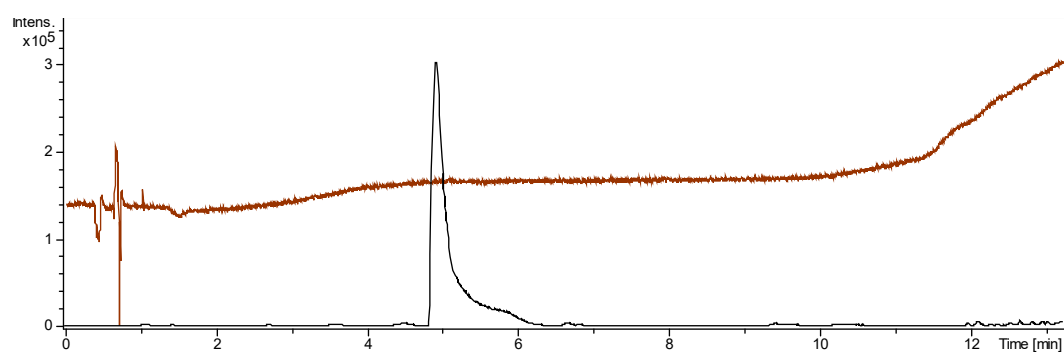


Figure S51. UHPLC/ESI-QqTOF-MS/MS chromatogram of O-benzoyl-cycloprotobuxoline-D (8). Base peak chromatogram 200.0000-1000.0000 +All MS (black); UV-Chromatogram, 200-400 nm (red).

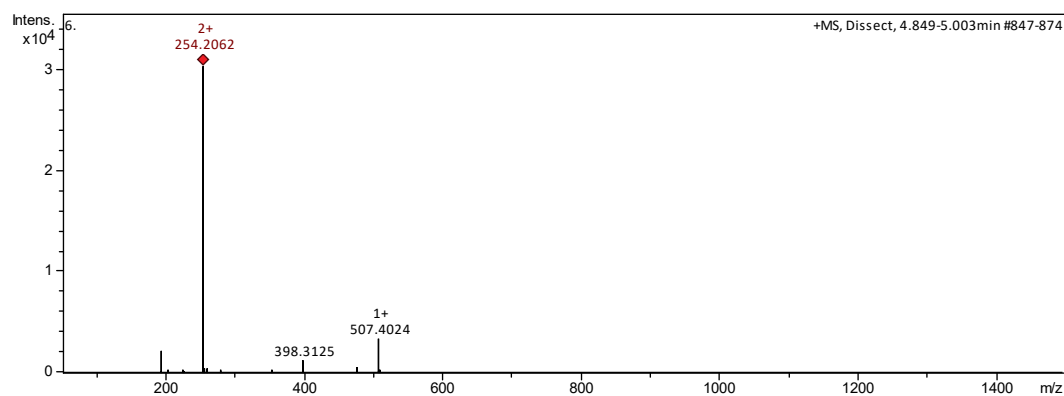


Figure S52. +ESI-QqTOF MS spectrum of O-benzoyl-cycloprotobuxoline-D (8); m/z 254.2062 $[M+2H]^{2+}$ and 507.4042 $[M+H]^+$.

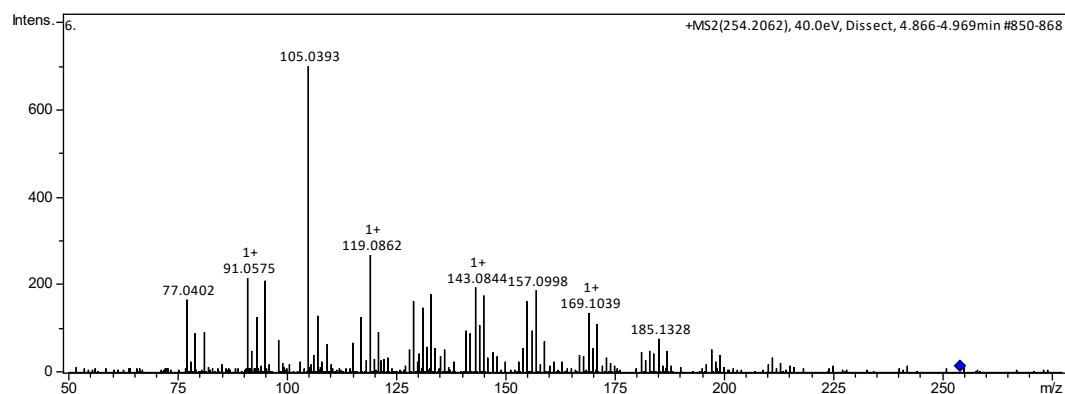


Figure S53. +ESI-QqTOF MS/MS spectrum of O-benzoyl-cycloprotobuxoline-D (8).

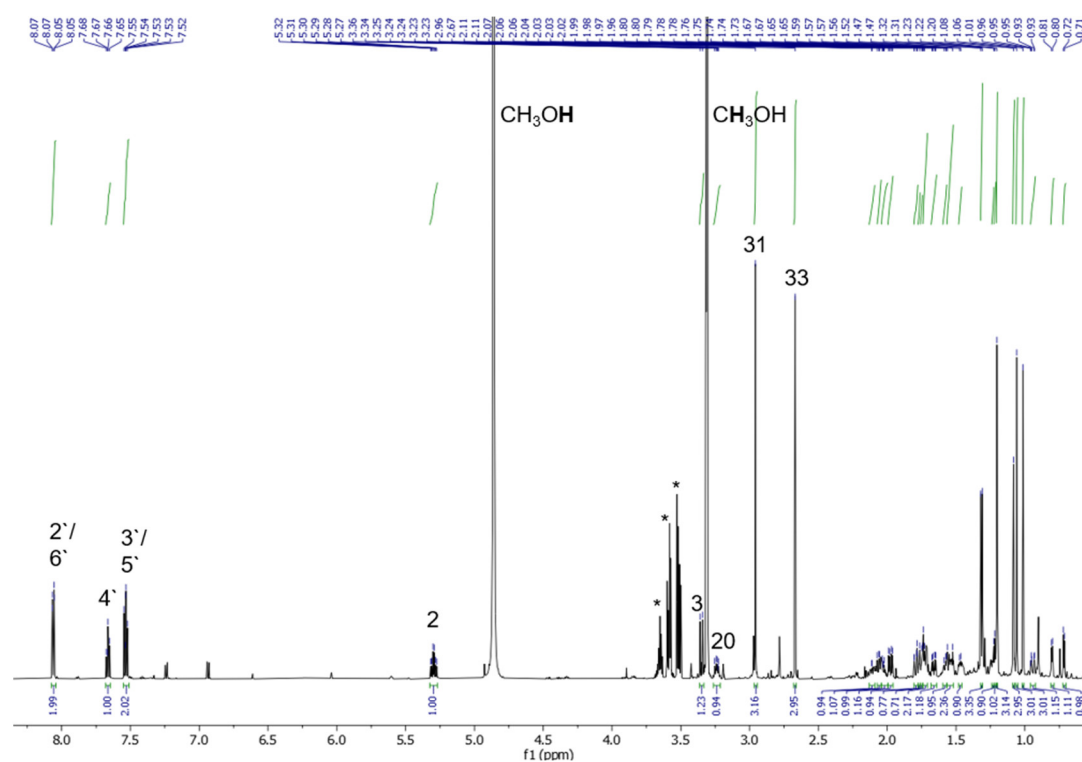


Figure S54. ^1H NMR spectrum of O-benzoyl-cycloprotobuxoline-D (8) (CD_3OD , 600 MHz). The assignment of the signals between 0.7 and 2.15 ppm can be found in the enlarged Figure S55 (*signals of 17.2% glycerol).

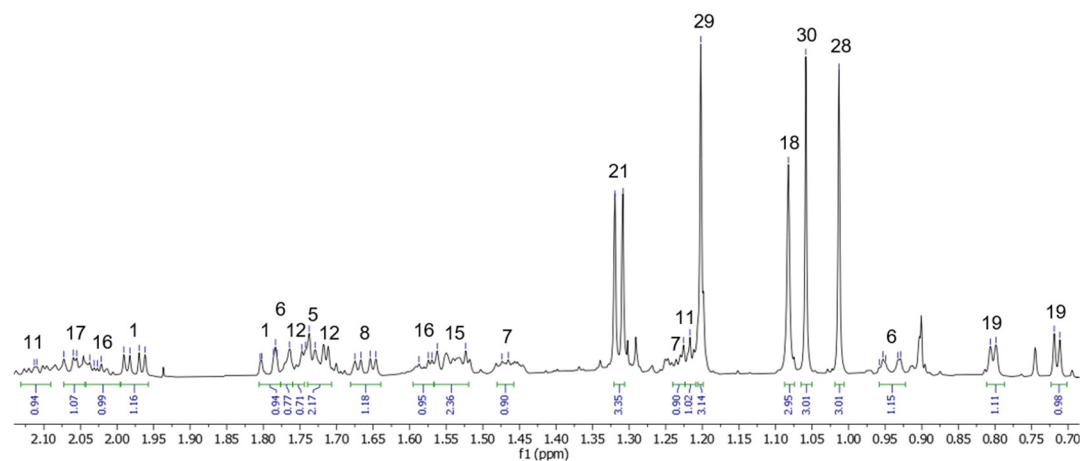


Figure S55. Detail of the ^1H NMR spectrum of O-benzoyl-cycloprotobuxoline-D (**8**) (CD_3OD , 600 MHz).

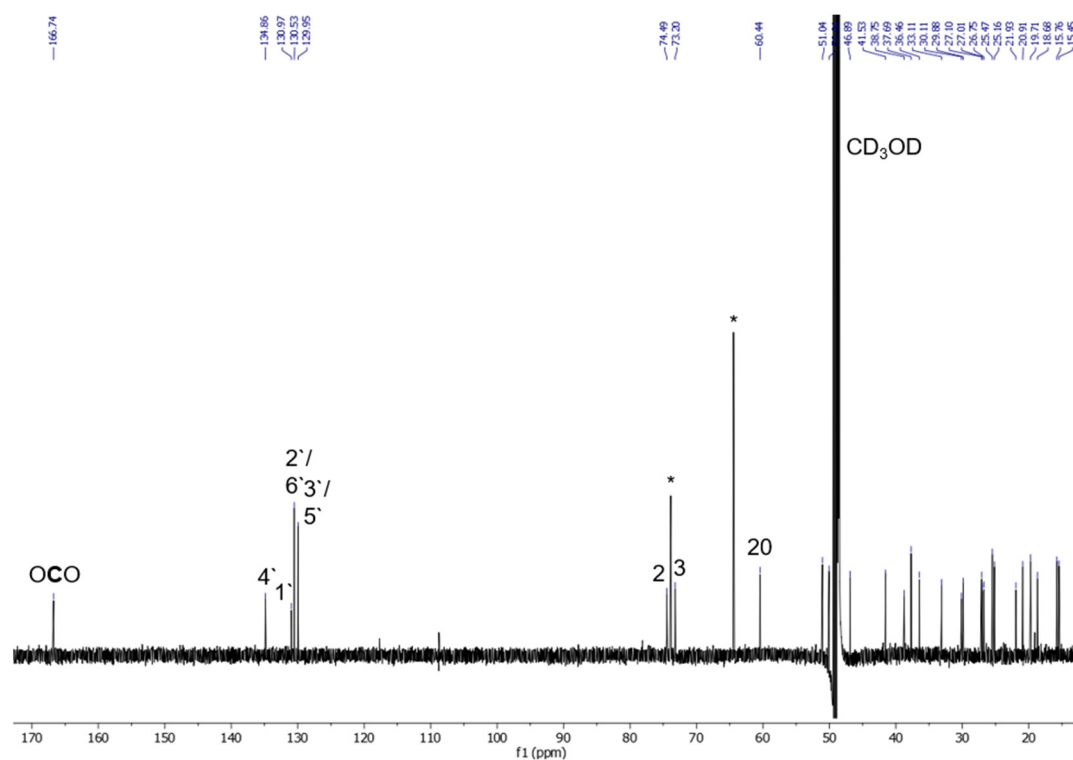


Figure S56. ^{13}C NMR spectrum of O-benzoyl-cycloprotobuxoline-D (**8**) (CD_3OD , 150 MHz). The assignment of the signals between 15 and 52 ppm can be found in the enlarged Figure S57 (*signals of 17.2% glycerol).

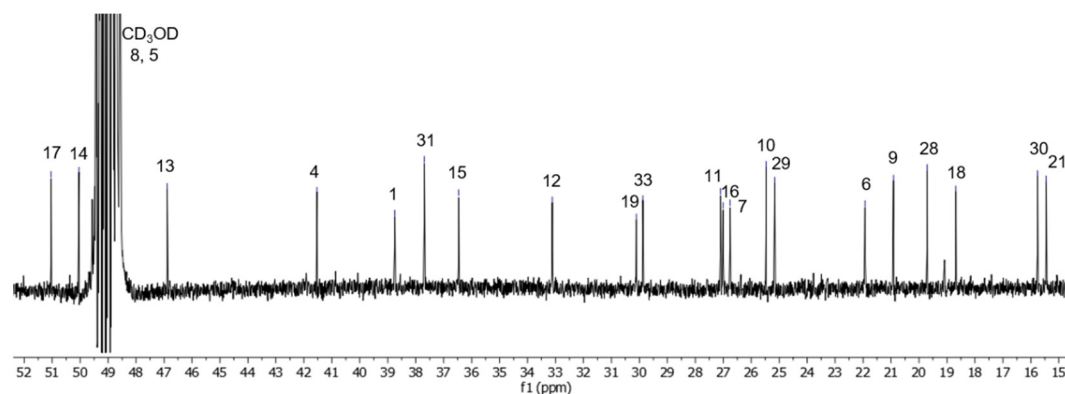


Figure S57. Detail of the ^{13}C NMR spectrum of O-benzoyl-cycloprotobuxoline-D (8) (CD_3OD , 150 MHz).

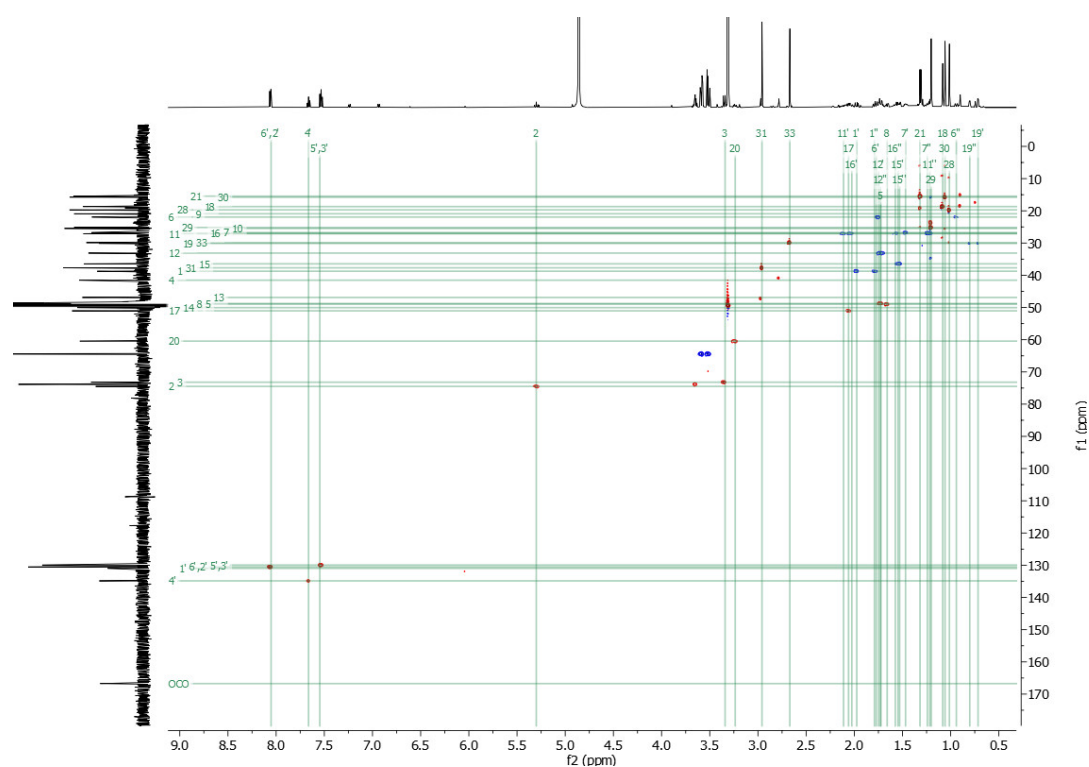


Figure S58. $^1\text{H}/^{13}\text{C}$ HSQC spectrum of O-benzoyl-cycloprotobuxoline-D (8) (CD_3OD , 600/150 MHz).

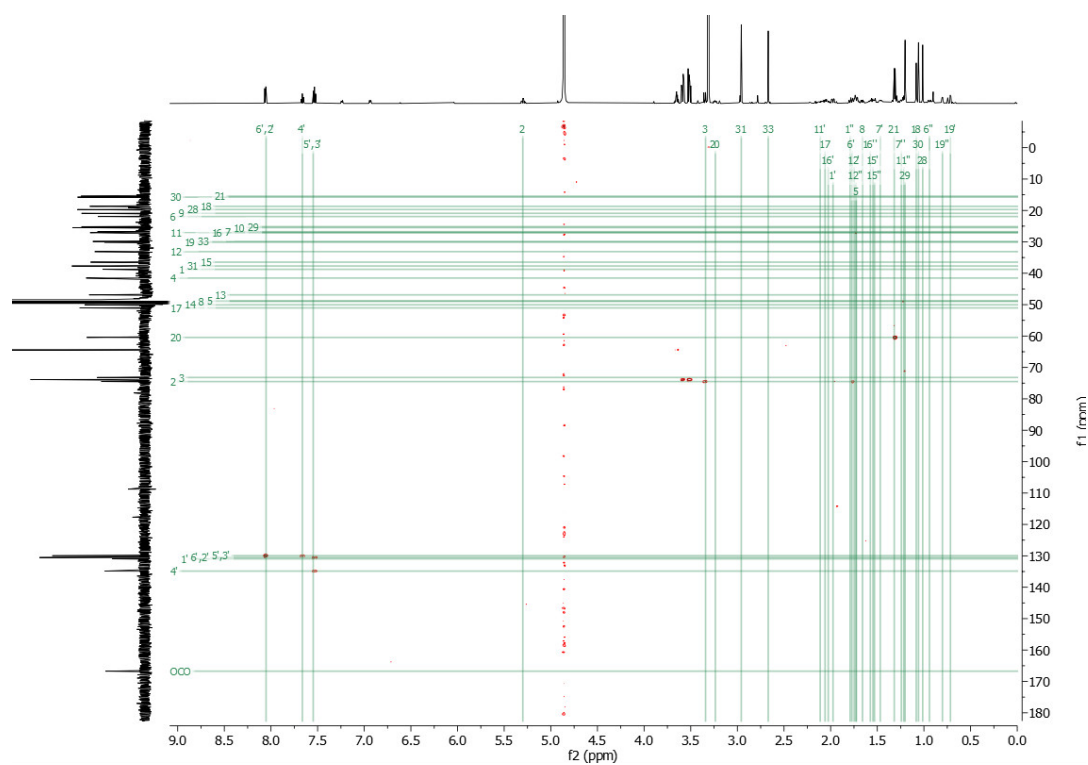


Figure S59. $^1\text{H}/^{13}\text{C}$ H2BC spectrum of O-benzoyl-cycloprotobuxoline-D (**8**) (CD_3OD , 600/150 MHz).

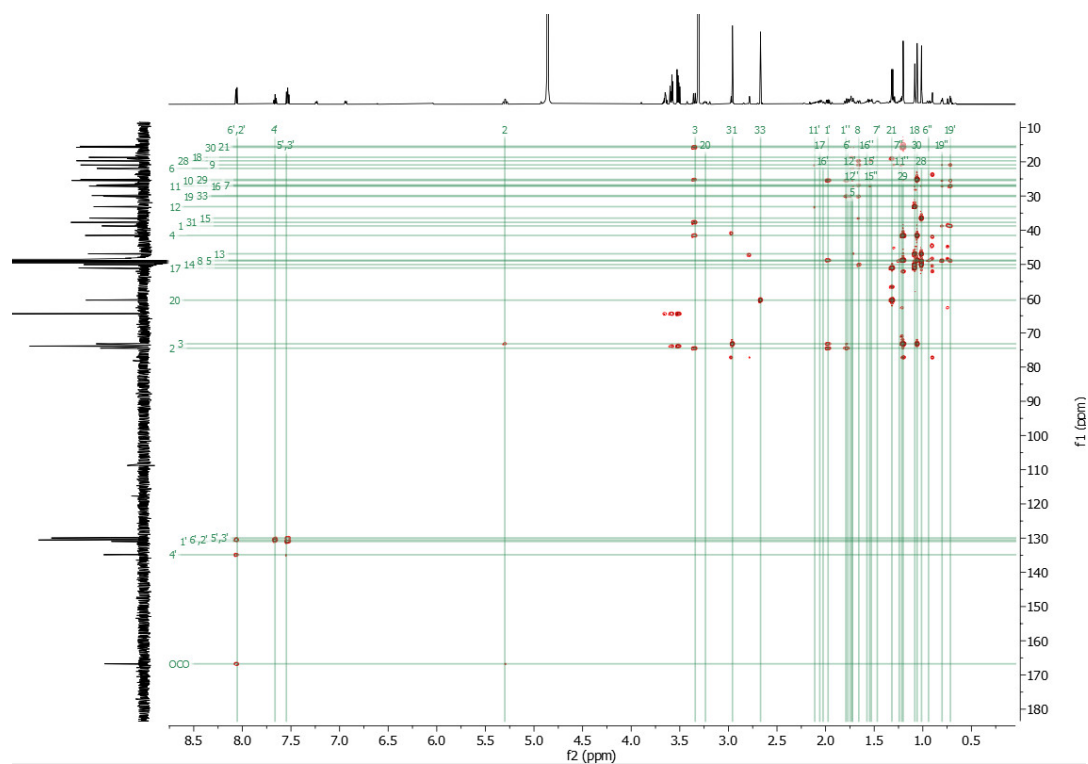


Figure S60. $^1\text{H}/^{13}\text{C}$ HMBC spectrum of O-benzoyl-cycloprotobuxoline-D (**8**) (CD_3OD , 600/150 MHz).

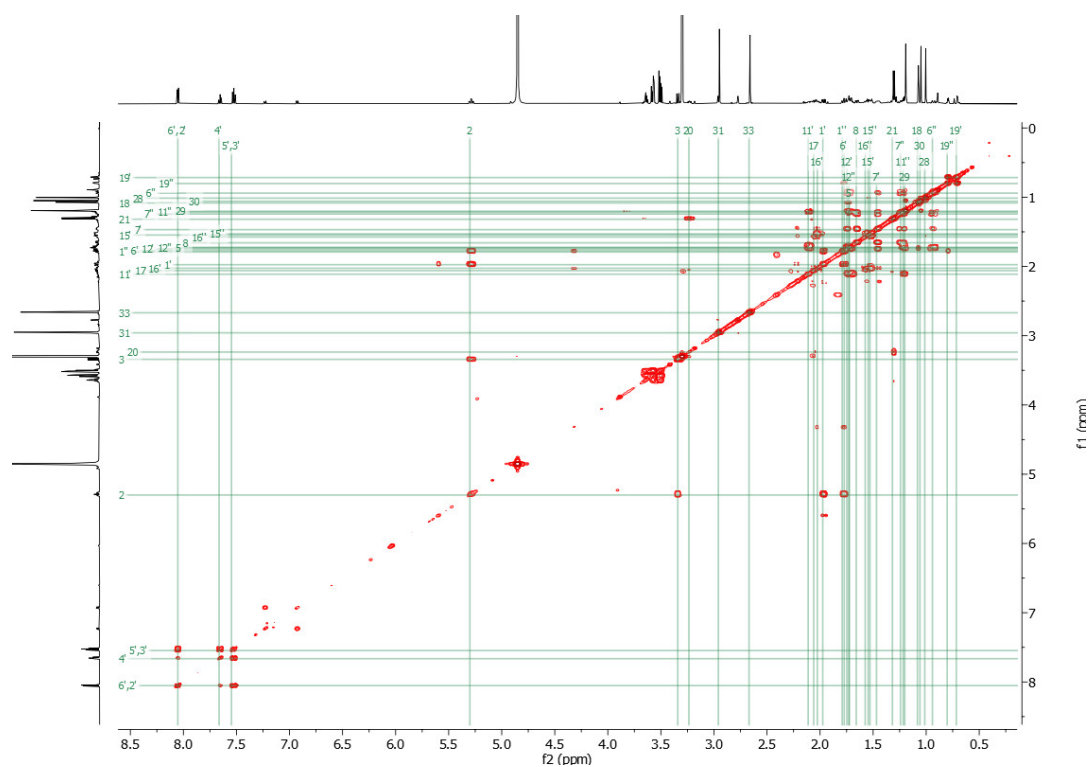


Figure S61. $^1\text{H}/^1\text{H}$ COSY spectrum of O-benzoyl-cycloprotobuxoline-D (8) (CD_3OD , 600 MHz).

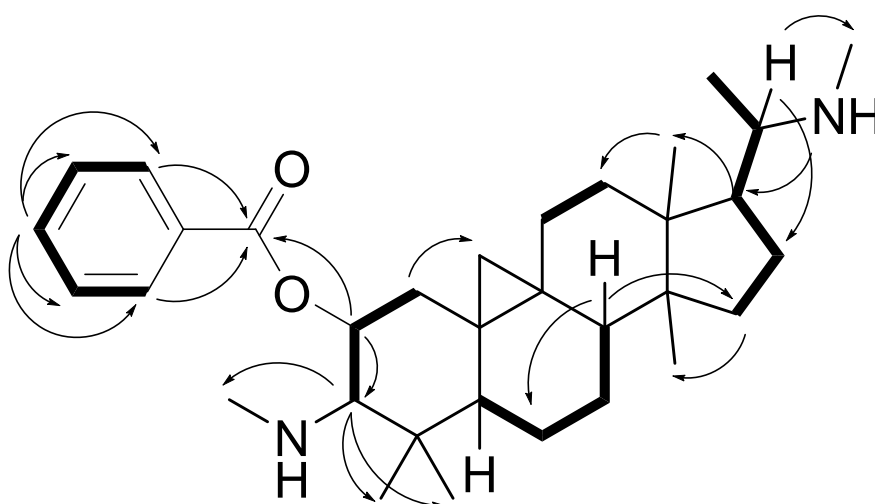


Figure S62. Key COSY (bold lines) and HMBC (arrows) correlations of O-benzoyl-cycloprotobuxoline-D (8).

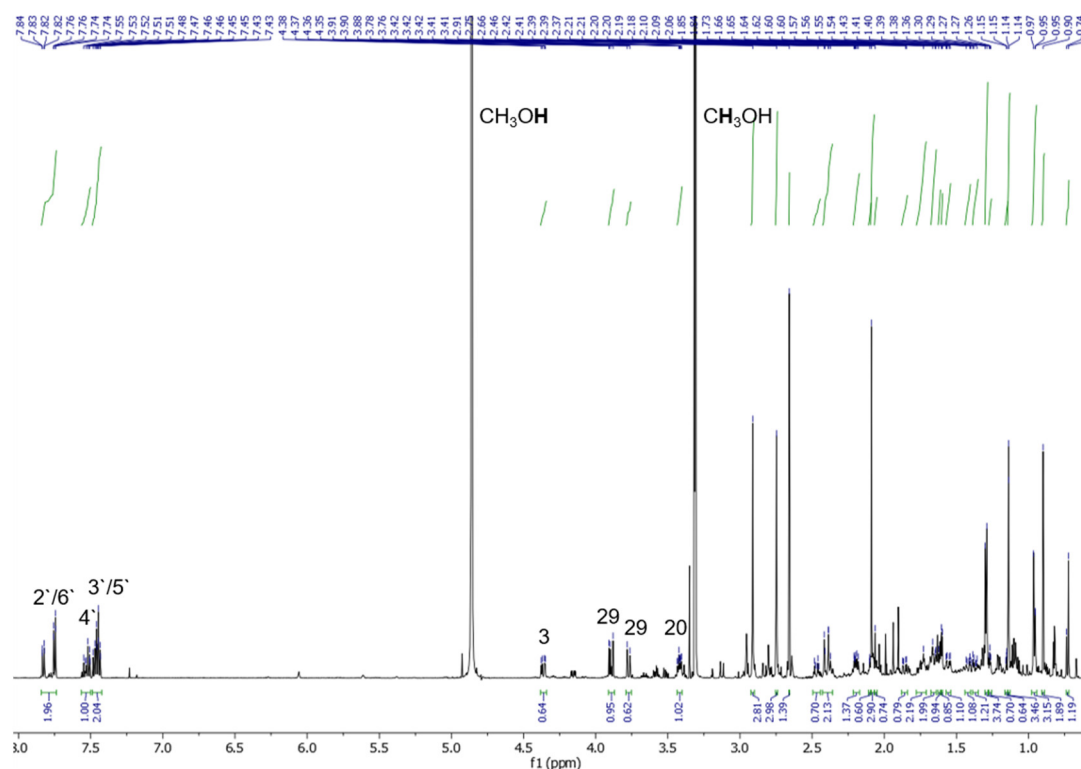


Figure S63. ^1H NMR spectrum of N-benzoyl-O-acetyl-cycloxo-buxoline-F (9) (CD_3OD , 600 MHz). The assignment of the signals between 0.85 and 2.93 ppm can be found in the enlarged Figure S64.

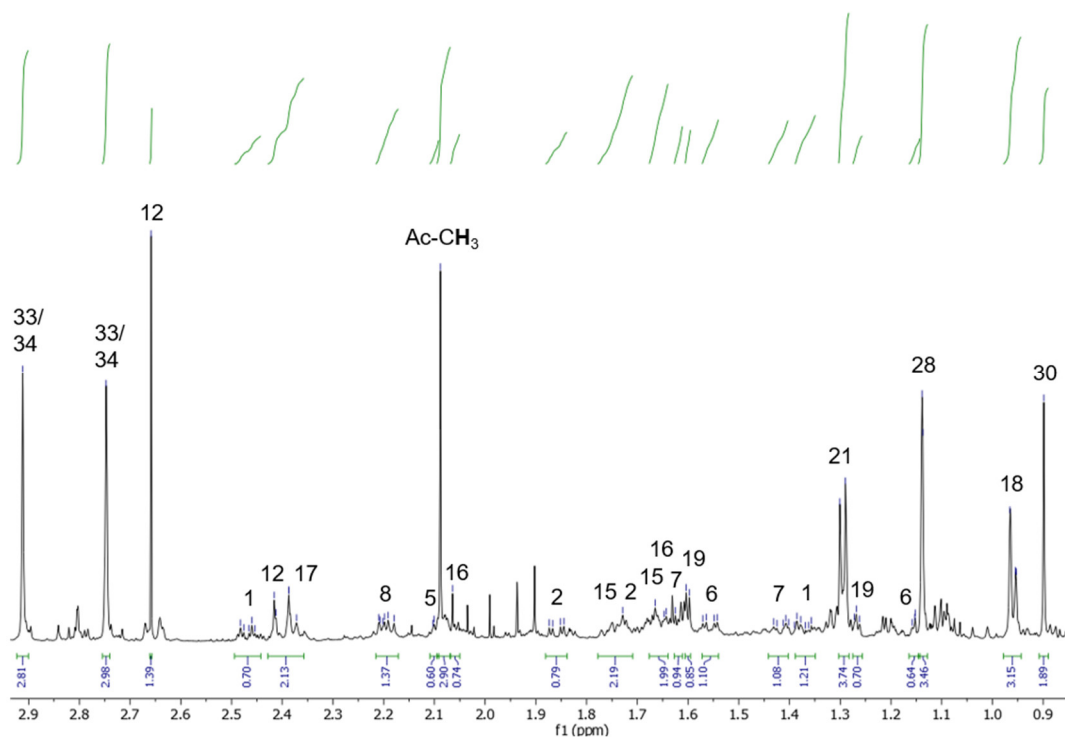


Figure S64. Detail of the ^1H NMR spectrum of N-benzoyl-O-acetyl-cycloxo-buxoline-F (9) (CD_3OD , 600 MHz).

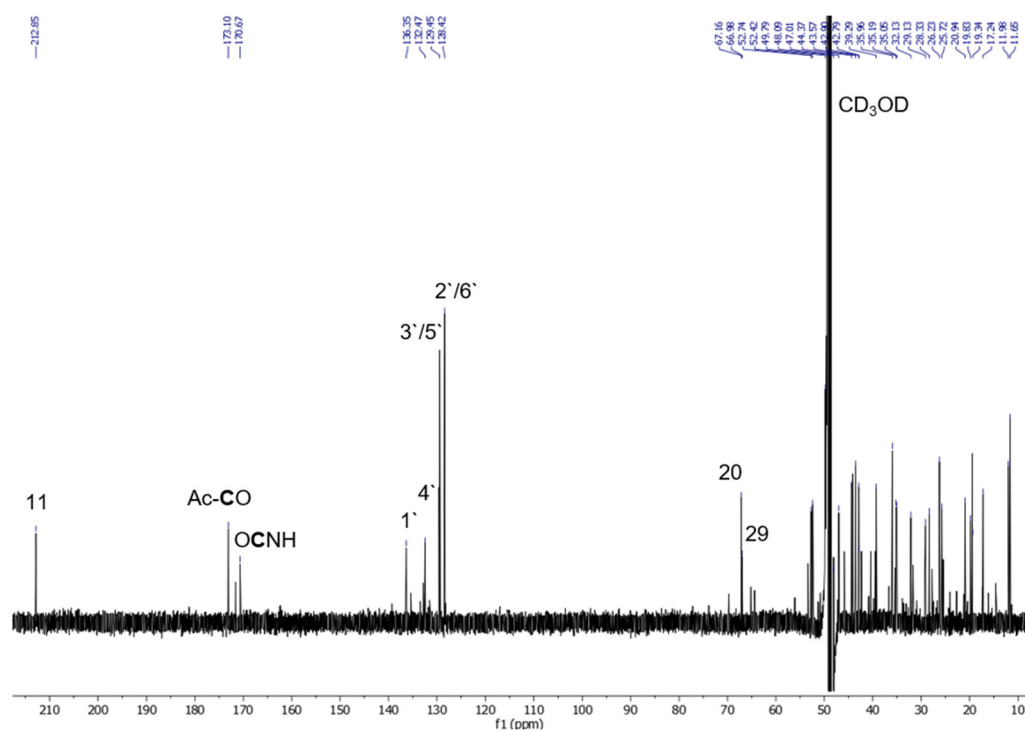


Figure S65. ^{13}C NMR spectrum of N-benzoyl-O-acetyl-cycloxo-buxoline-F (9) (CD_3OD , 150 MHz). The assignment of the signals between 11.5 and 52.8 ppm can be found in the enlarged Figure S66.

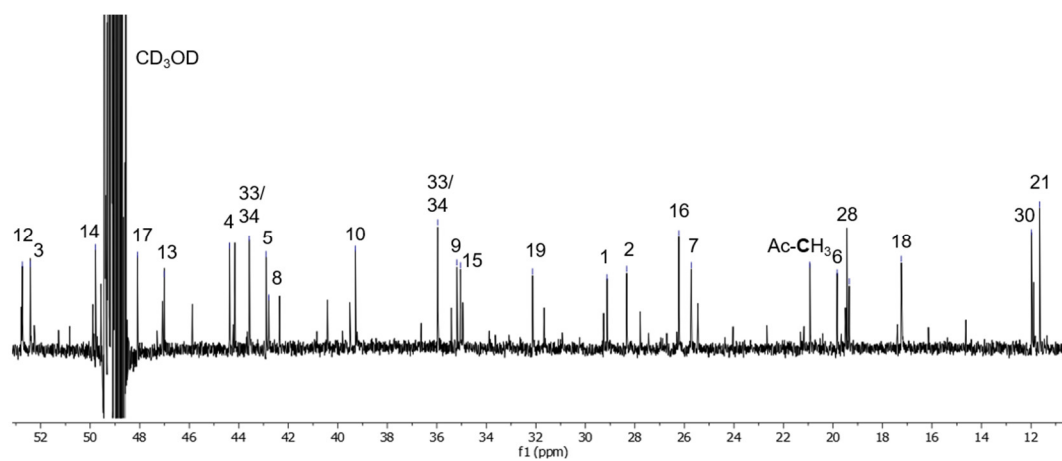


Figure S66. Detail of the ^{13}C NMR spectrum of N-benzoyl-O-acetyl-cycloxo-buxoline-F (9) (CD_3OD , 150 MHz).

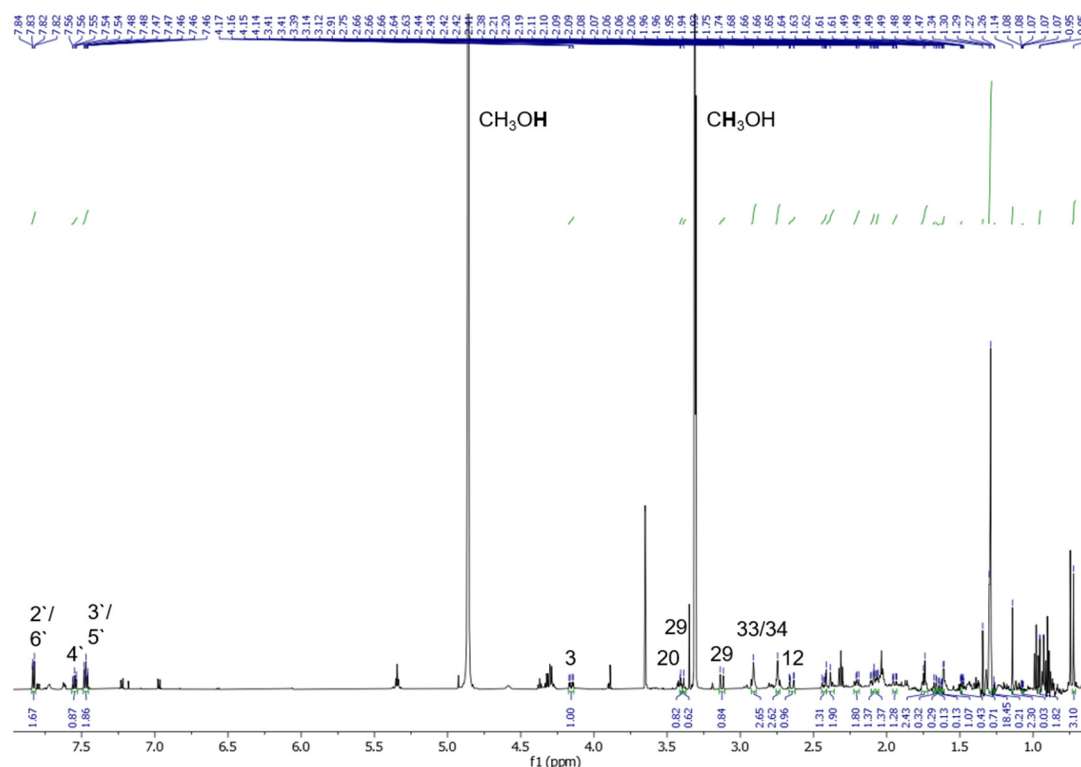


Figure S67. ^1H NMR spectrum of N-benzoyl-cycloxo-buxoline-F (**10**) (CD_3OD , 600 MHz). The assignment of the signals between 0.7 and 2.5 ppm can be found in the enlarged Figure S68.

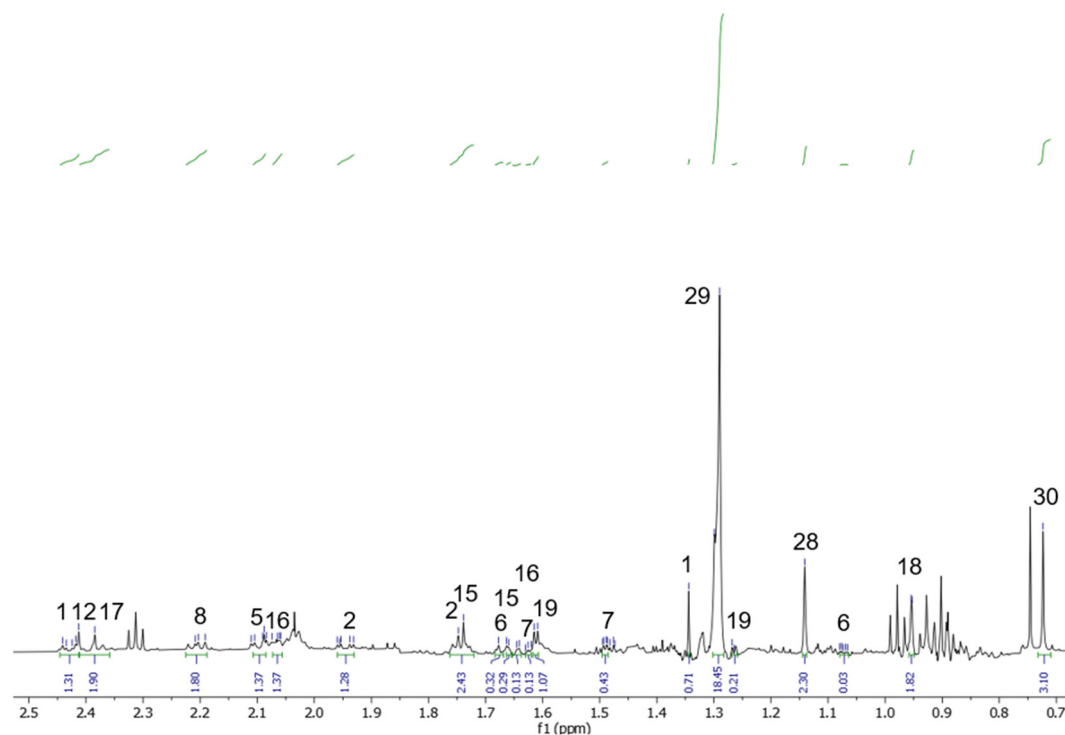


Figure S68. Detail of the ^1H NMR spectrum of N-benzoyl-cycloxo-buxoline-F (**10**) (CD_3OD , 600 MHz).

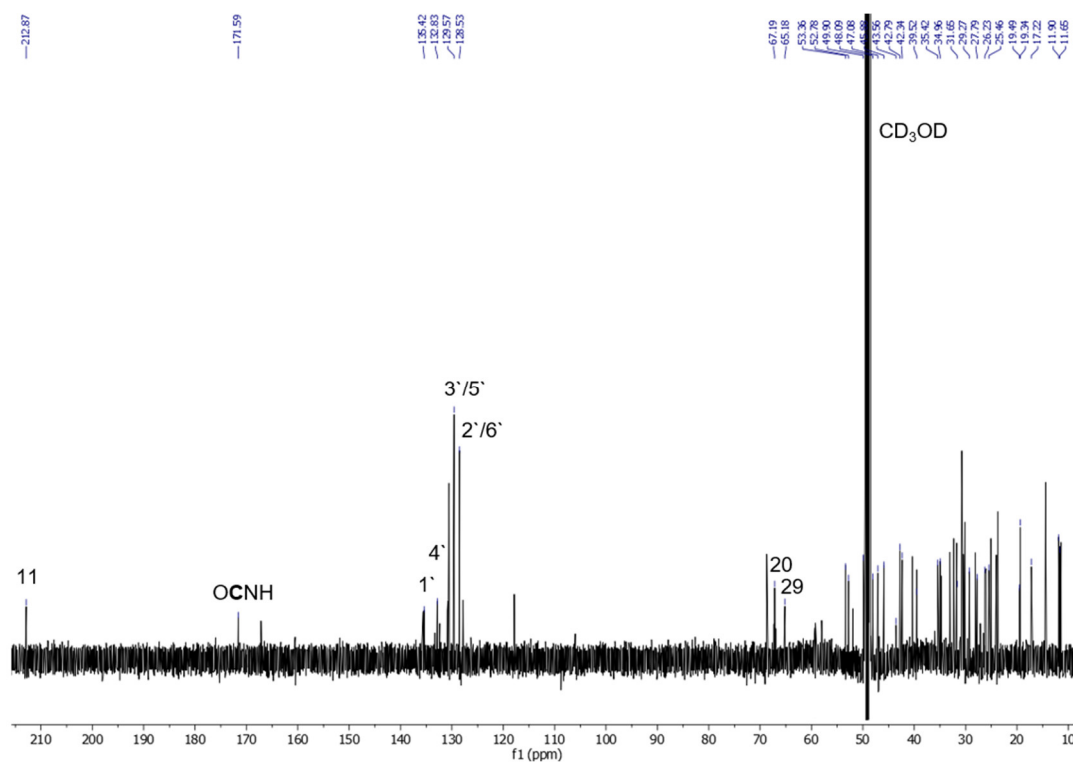


Figure S69. ^{13}C NMR spectrum of N-benzoyl-cyclooxo-buxoline-F (**10**) (CD_3OD , 150 MHz). The assignment of the signals between 11 and 54 ppm can be found in the enlarged Figure S70.

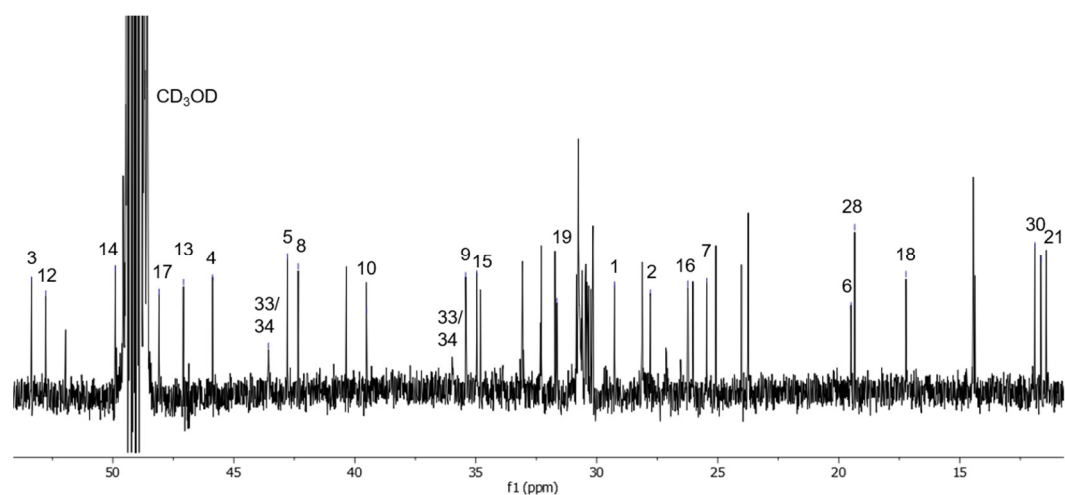


Figure S70. Detail of the ^{13}C NMR spectrum of N-benzoyl-cyclooxo-buxoline-F (**10**) (CD_3OD , 150 MHz).

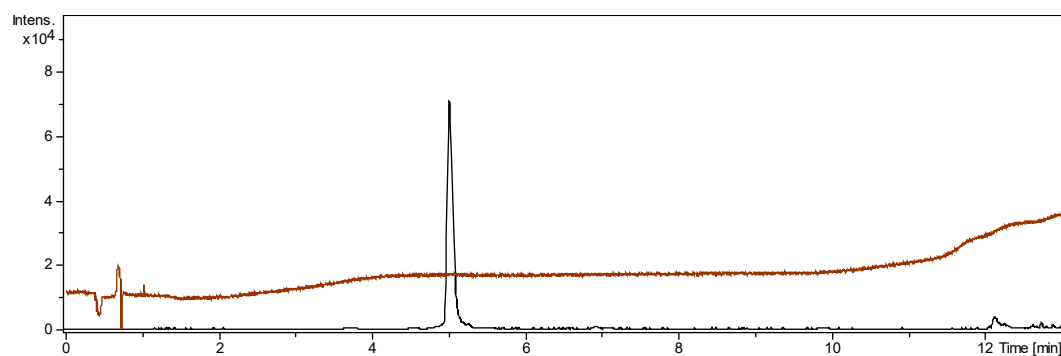


Figure S71. UHPLC/ESI-QqTOF-MS/MS chromatogram of 29-hydroxy-cyclomikuranine-L (**11**). Base peak chromatogram 200.0000-1000.0000 +All MS (black); UV-Chromatogramm, 200-400 nm (red).

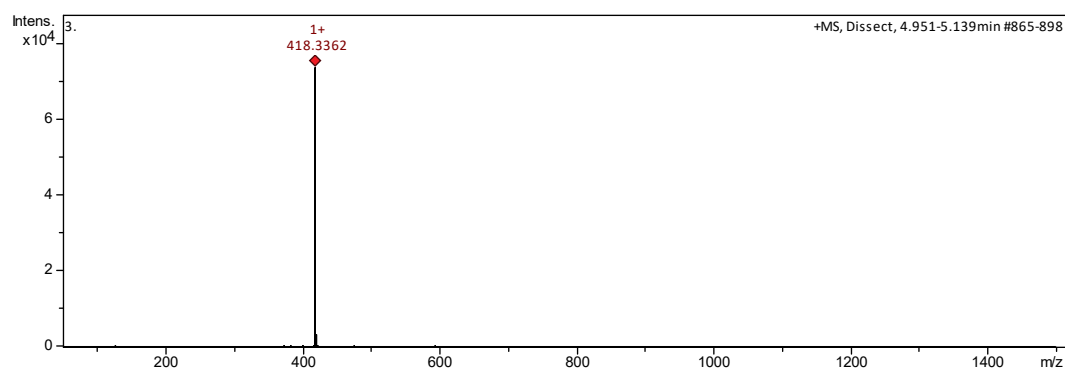


Figure S72. +ESI-QqTOF MS spectrum of 29-hydroxy-cyclomikuranine-L (**11**); m/z 418.3362 $[M+H]^+$.

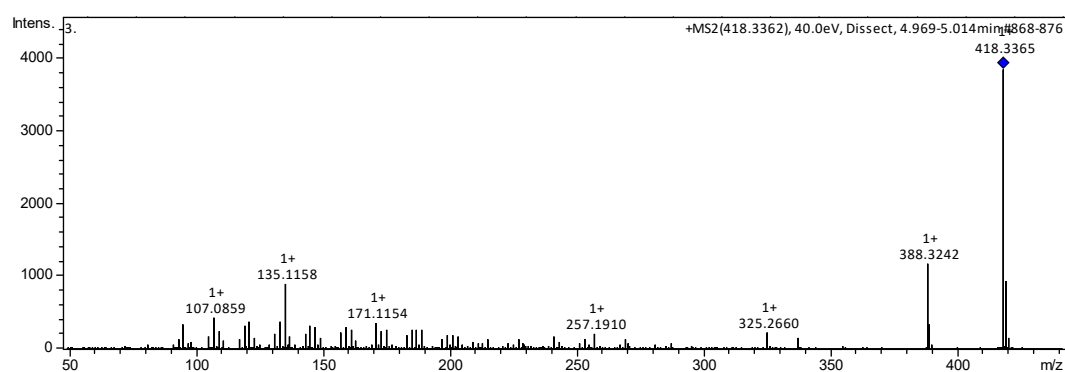


Figure S73. +ESI-QqTOF MS/MS spectrum of 29-hydroxy-cyclomikuranine-L (**11**).

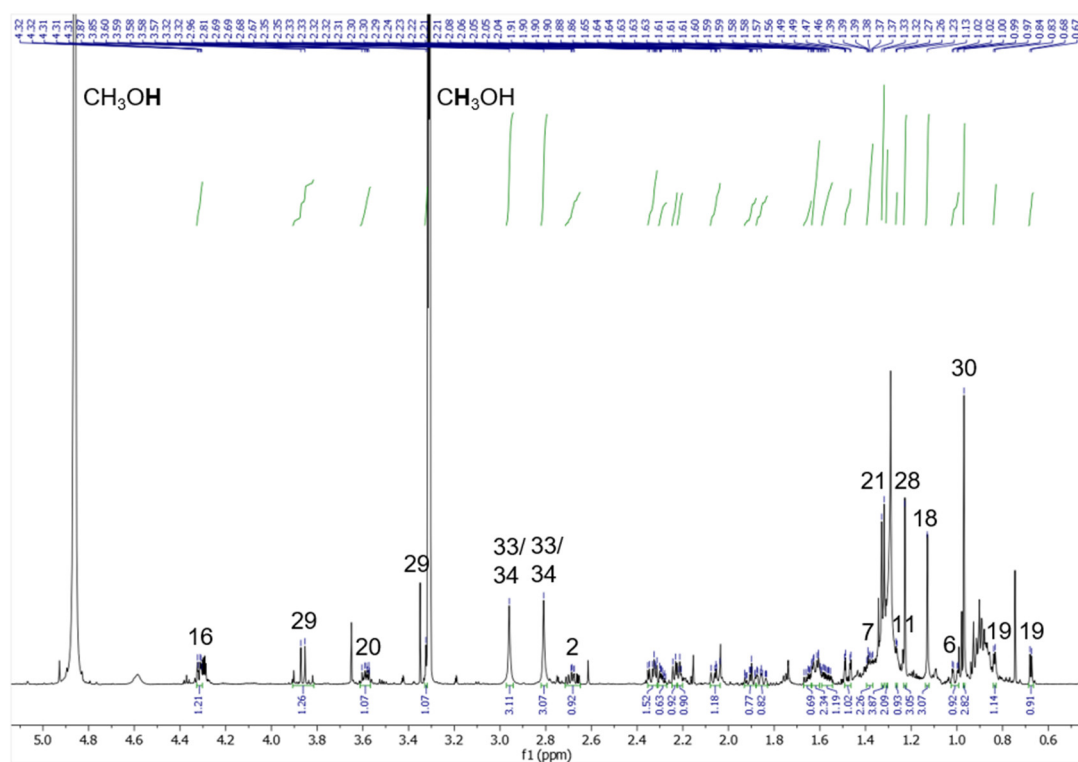


Figure S74. ^1H NMR spectrum of 29-hydroxy-cyclomikuranine-L (**11**) (CD_3OD , 600 MHz). The assignment of the signals between 1.45 and 2.4 ppm can be found in the enlarged Figure S75.

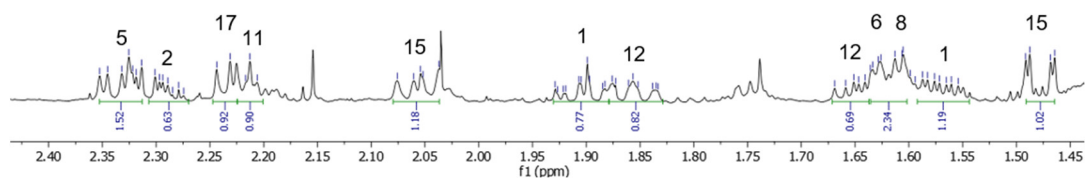


Figure S75. Detail of the ^1H NMR spectrum of 29-hydroxy-cyclomikuranine-L (**11**) (CD_3OD , 600 MHz).

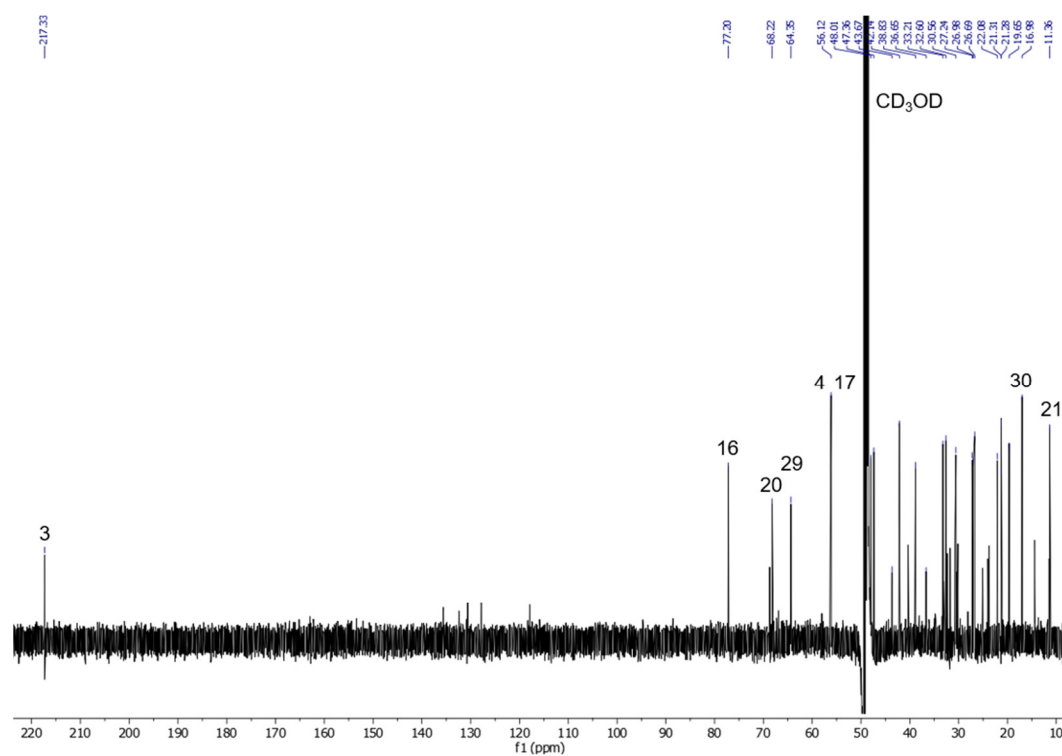


Figure S76. ¹³C NMR spectrum of 29-hydroxy-cyclomikuranine-L (**11**) (CD₃OD, 150 MHz). The assignment of the signals between 19 and 49.5 ppm can be found in the enlarged Figure S77.

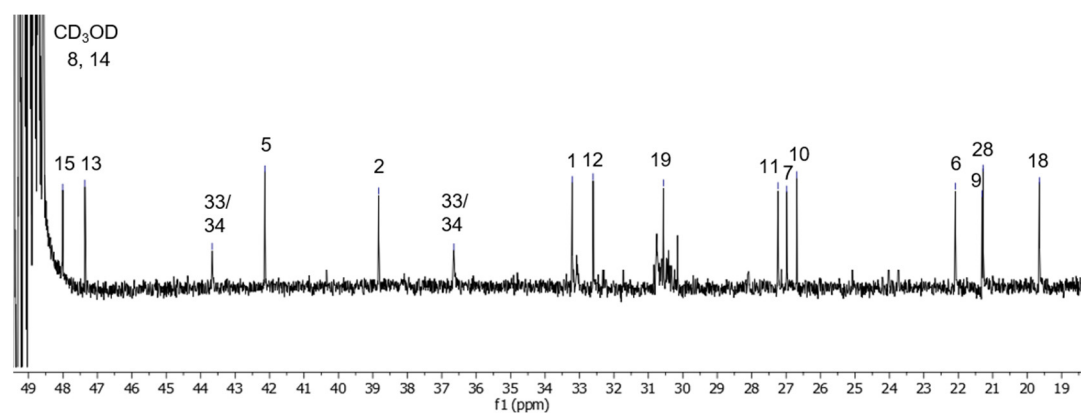


Figure S77. Detail of the ¹³C NMR spectrum of 29-hydroxy-cyclomikuranine-L (**11**) (CD₃OD, 150 MHz).

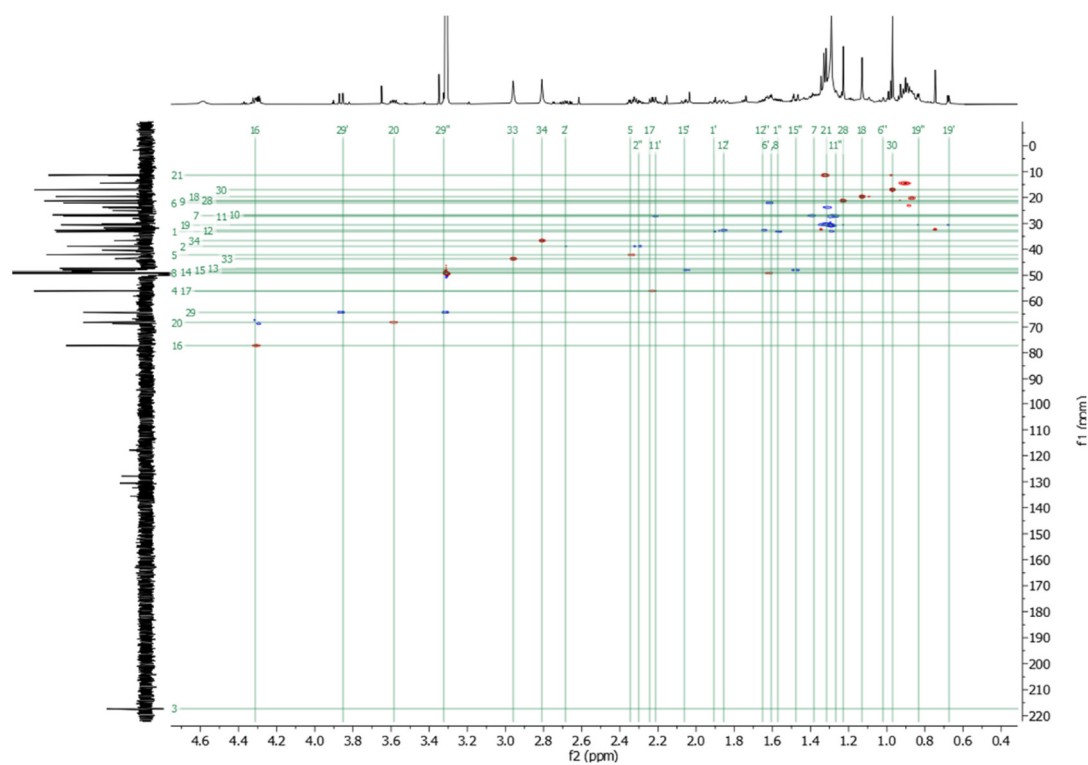


Figure S78. $^1\text{H}/^{13}\text{C}$ HSQC spectrum of 29-hydroxy-cyclomikuranine-L (**11**) (CD_3OD , 600/150 MHz).

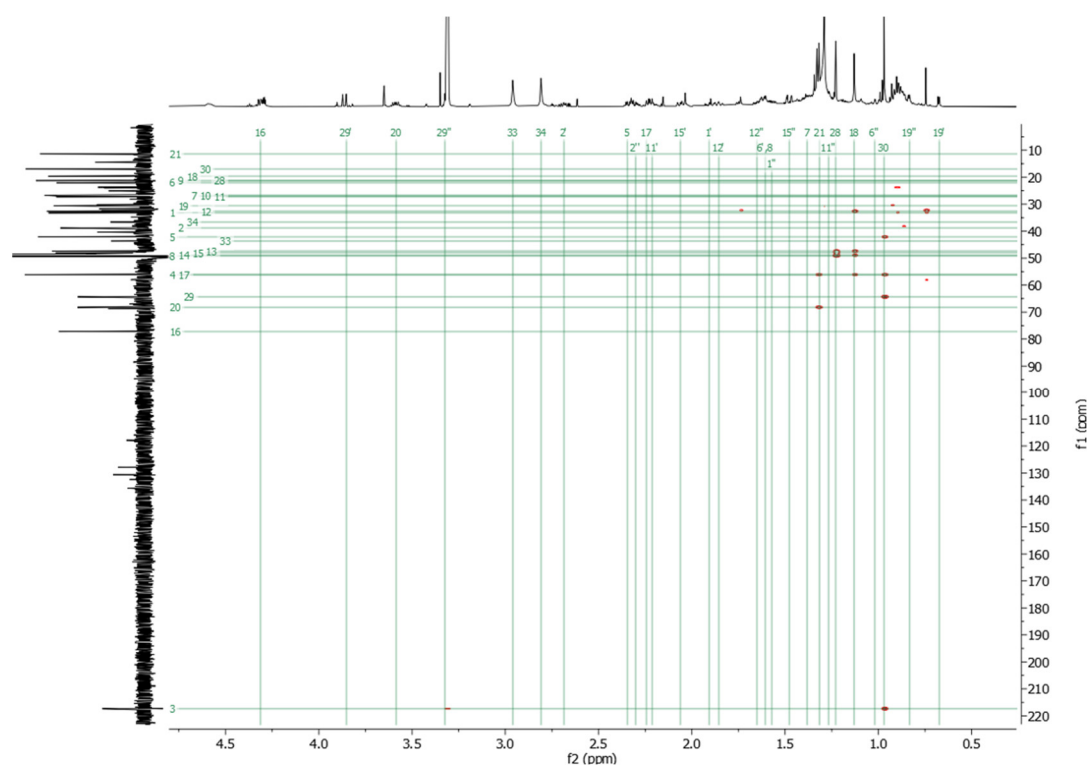


Figure S79. $^1\text{H}/^{13}\text{C}$ HMBC spectrum of 29-hydroxy-cyclomikuranine-L (**11**) (CD_3OD , 600/150 MHz).

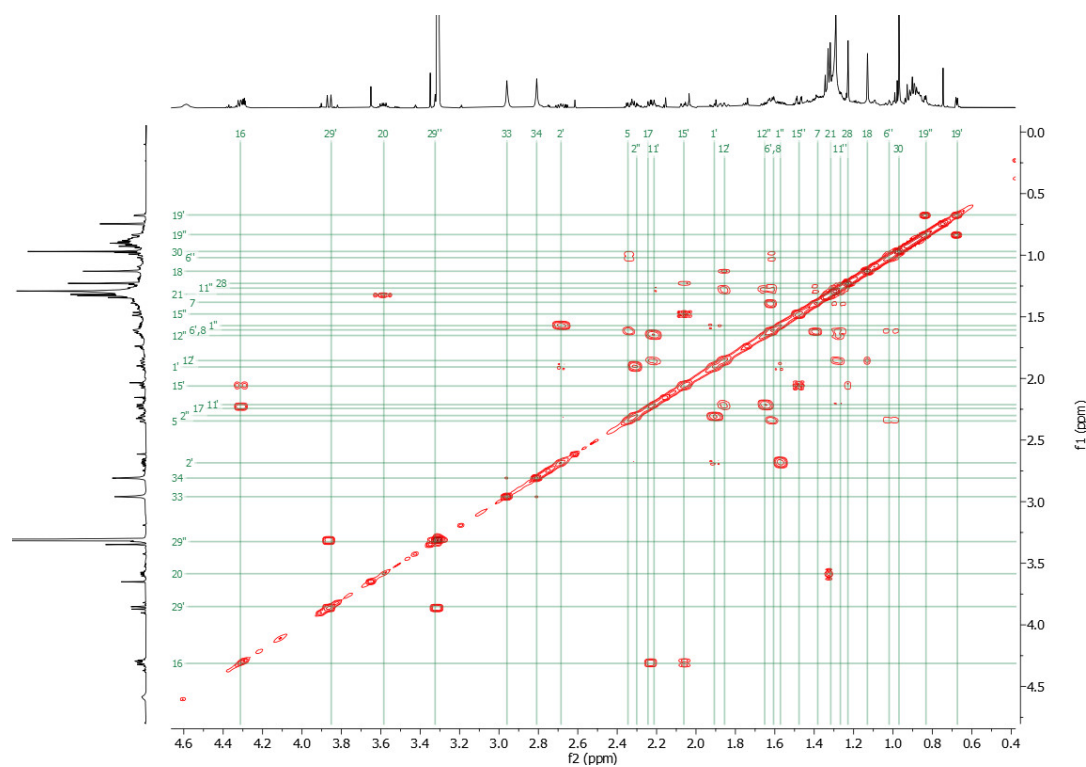


Figure S80. $^1\text{H}/^1\text{H}$ COSY spectrum of 29-hydroxy-cyclomikuranine-L (**11**) (CD_3OD , 600 MHz).

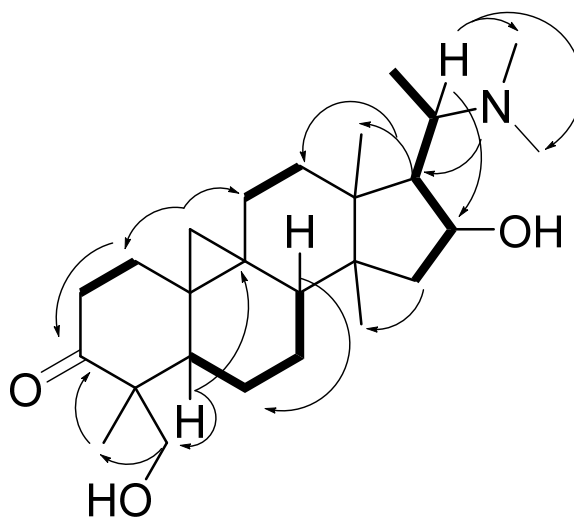


Figure S81. Key COSY (bold lines) and HMBC (arrows) correlations of 29-hydroxy-cyclomikuranine-L (**11**).

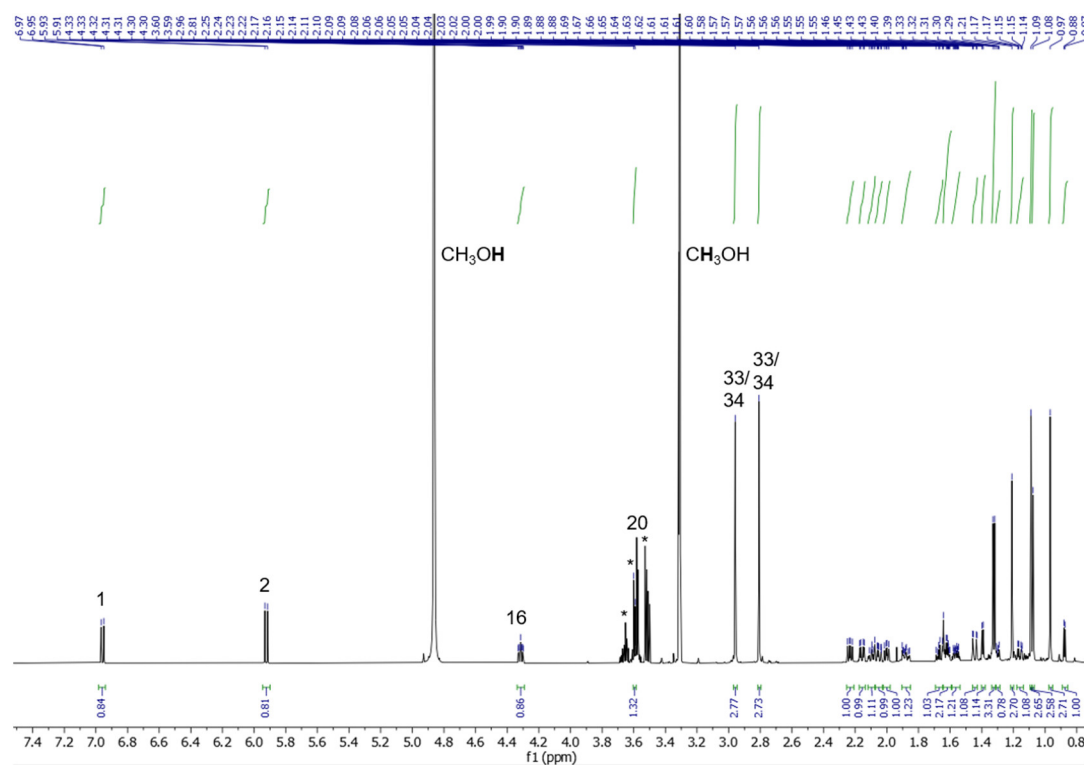


Figure S82. ^1H NMR spectrum of N_6 -dimethylcyclohexovirine (**12**) (CD_3OD , 600 MHz). The assignment of the signals between 0.8 and 2.3 ppm can be found in the enlarged Figure S83 (*signals of 11.9% glycerol).

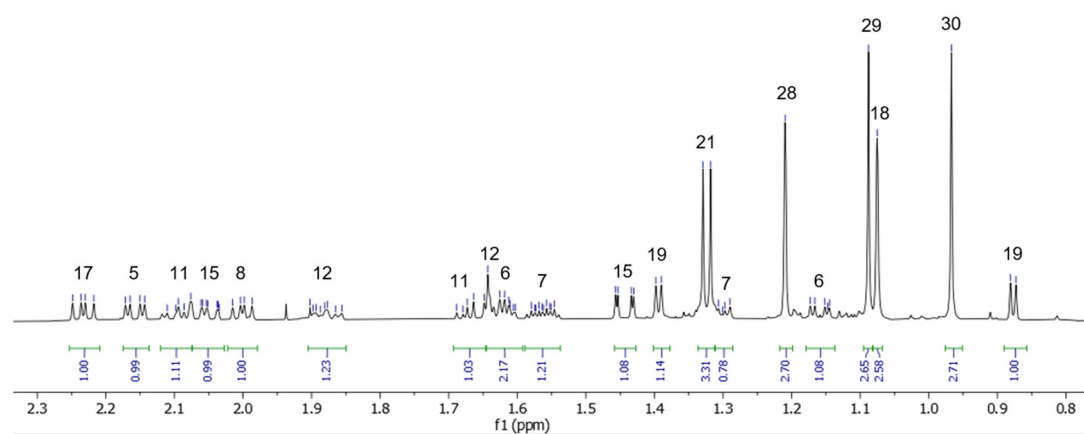


Figure S83. Detail of the ^1H NMR spectrum of N_6 -dimethylcyclohexovirine (**12**) (CD_3OD , 600 MHz).

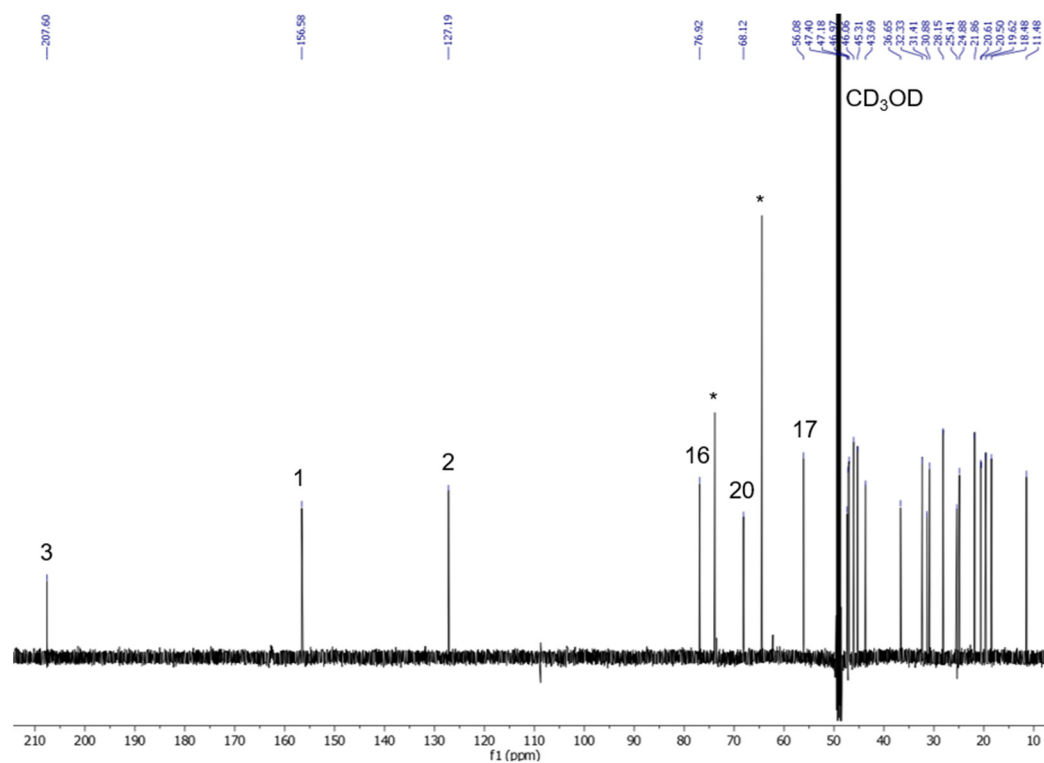


Figure S84. ^{13}C NMR spectrum of Nb-dimethylcyclohexoviridine (**12**) (CD_3OD , 150 MHz). The assignment of the signals between 11 and 50 ppm can be found in the enlarged Figure S85 (*signals of 11.9% glycerol).

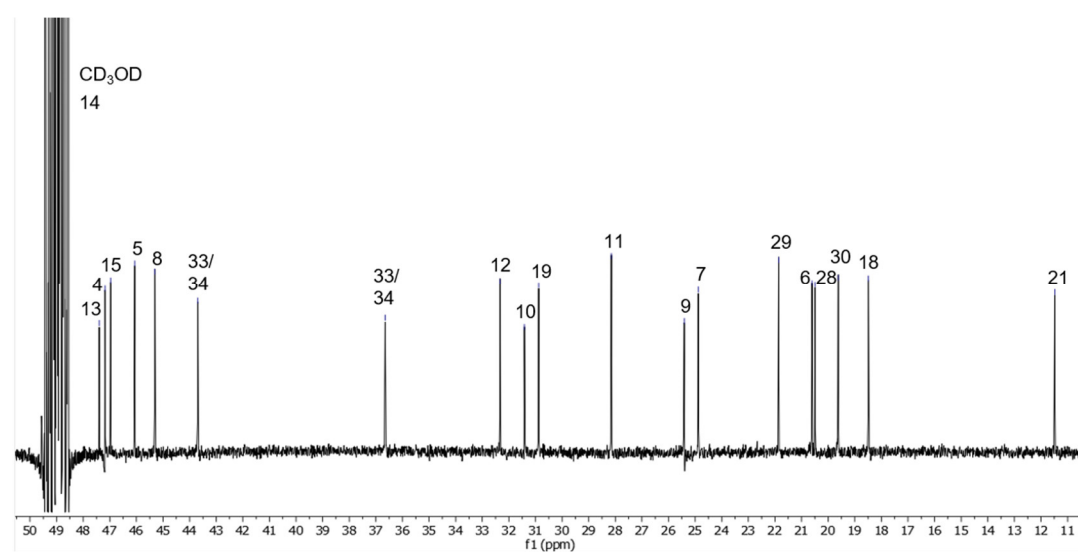


Figure S85. Detail of the ^{13}C NMR spectrum of Nb-dimethylcyclohexoviridine (**12**) (CD_3OD , 150 MHz).

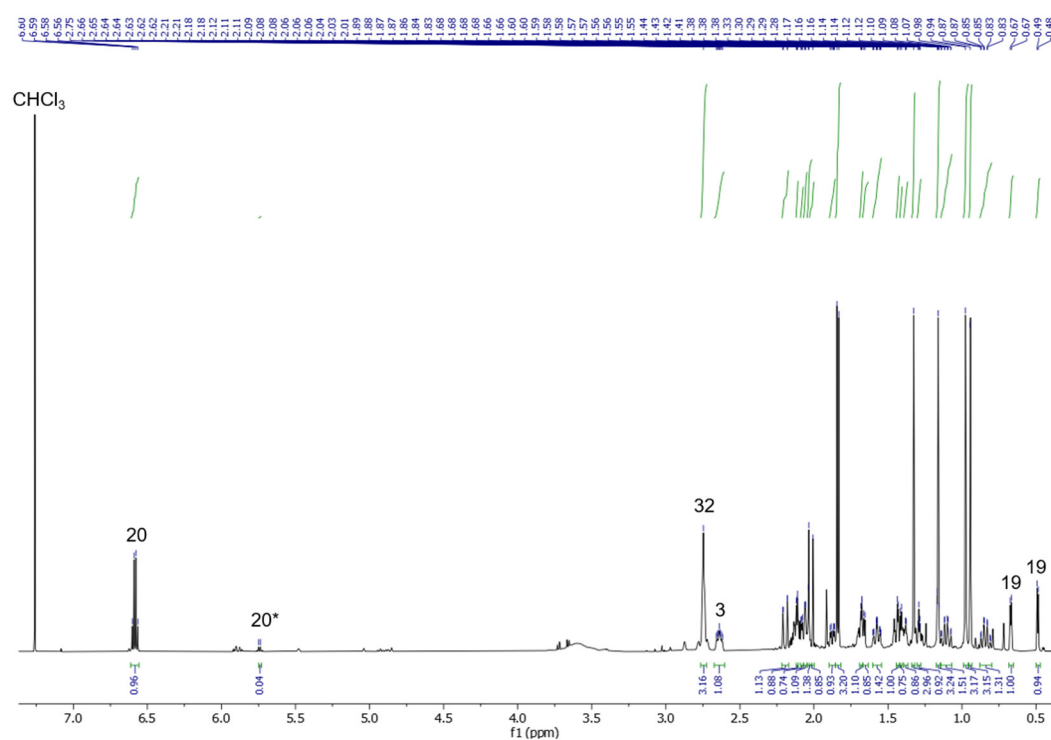


Figure S86. ^1H NMR spectrum of (*E*)-cyclobuxophyllinine-M (**13**) and (*Z*)-cyclobuxophyllinine-M (**14**) (CDCl_3 , 600 MHz). The assignment of the signals between 0.8 and 2.2 ppm can be found in the enlarged Figure S87 (*signal of compound **14**).

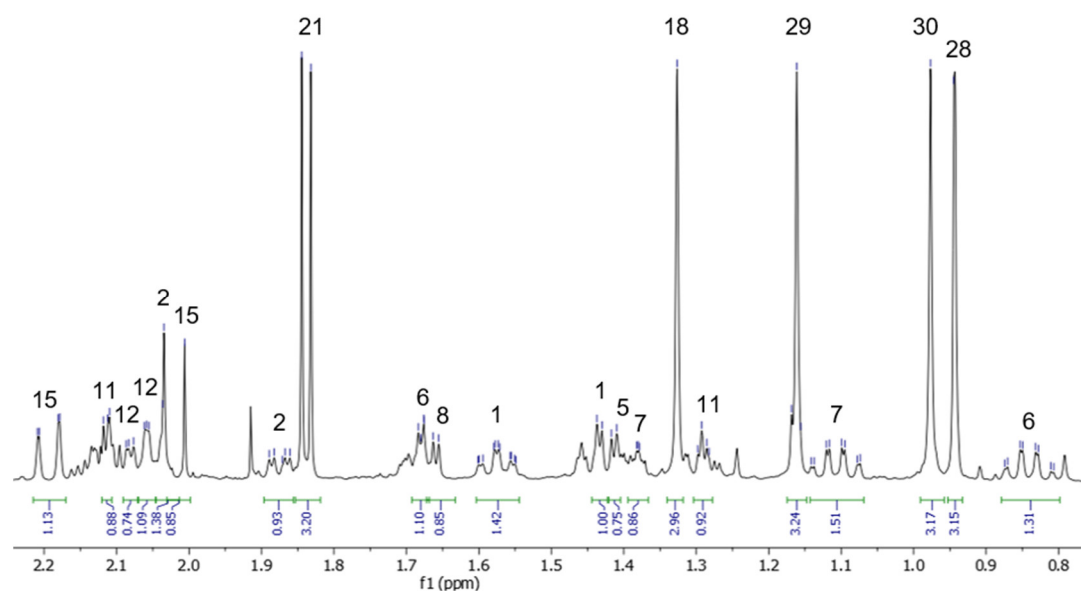


Figure S87. Detail of the ^1H NMR spectrum of (*E*)-cyclobuxophyllinine-M (**13**) and (*Z*)-cyclobuxophyllinine-M (**14**) (CDCl_3 , 600 MHz).

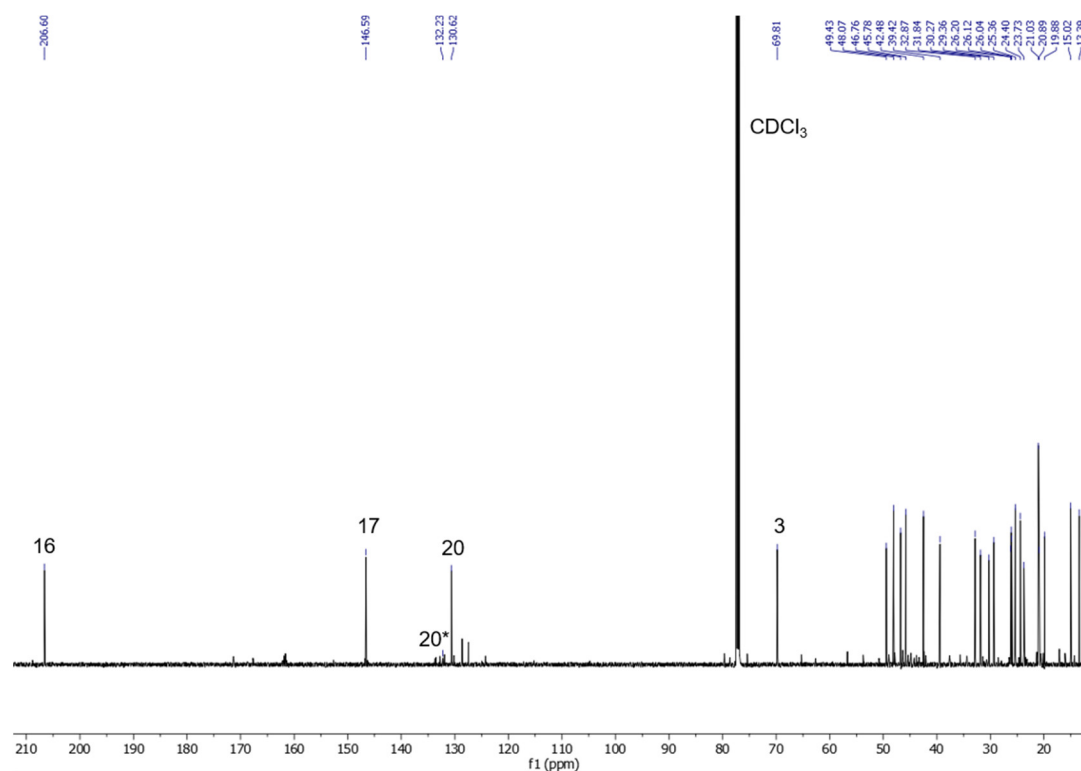


Figure S88. ¹³C NMR spectrum of (*E*)-cyclobuxophyllinine-M (**13**) and (*Z*)-cyclobuxophyllinine-M (**14**) (CDCl₃, 150 MHz). The assignment of the signals between 13 and 50 ppm can be found in the enlarged Figure S89 (*signal of compound **14**).

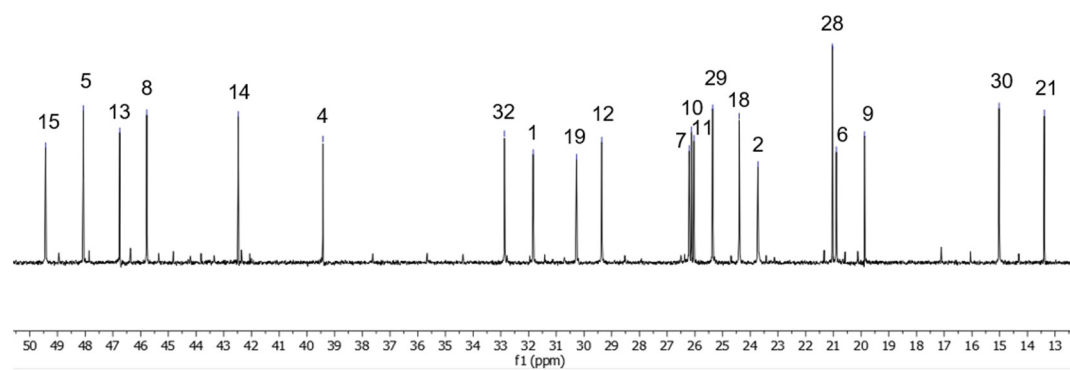


Figure S89. Detail of the ¹³C NMR spectrum of (*E*)-cyclobuxophyllinine-M (**13**) and (*Z*)-cyclobuxophyllinine-M (**14**) (CDCl₃, 150 MHz).

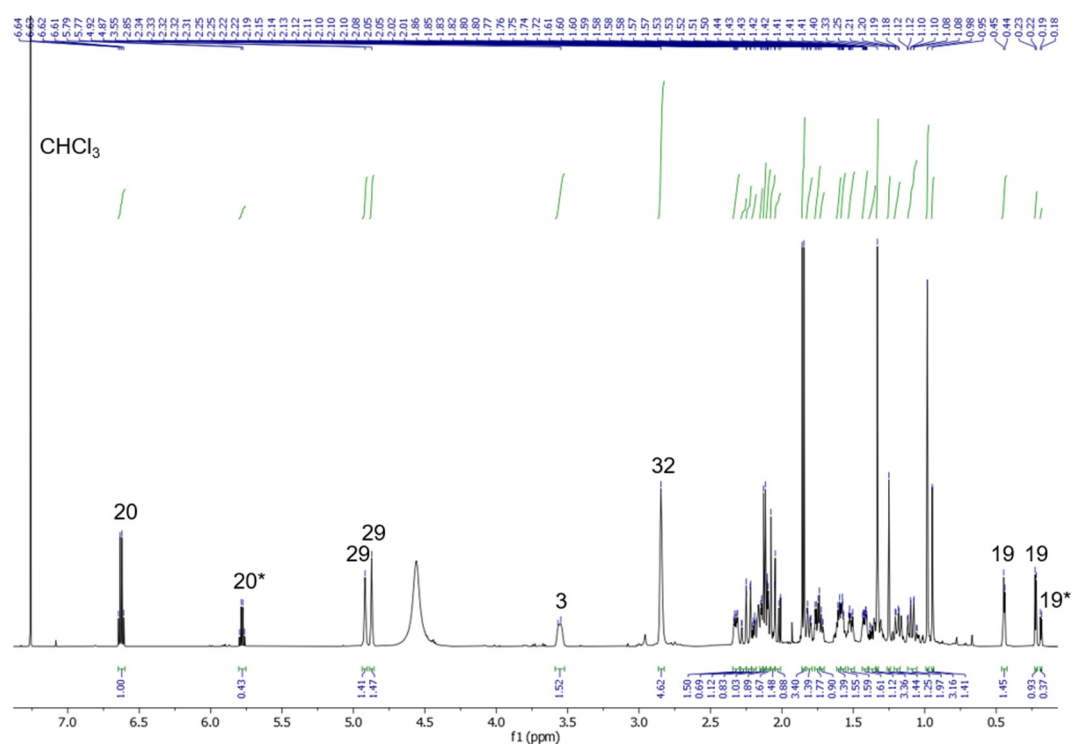


Figure S90. ^1H NMR spectrum of (*E*)-cyclosuffrobuxinine-M (**15**) and (*Z*)-cyclosuffrobuxinine-M (**16**) (CDCl_3 , 600 MHz). The assignment of the signals between 0.9 and 2.4 ppm can be found in the enlarged Figure S91 (*signals of compound **16**).

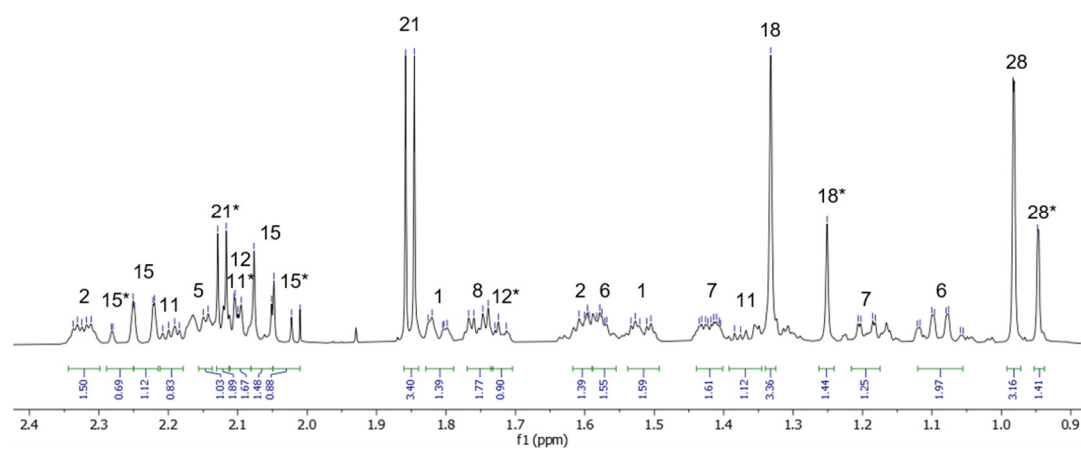


Figure S91. Detail of the ^1H NMR spectrum of (*E*)-cyclosuffrobuxinine-M (**15**) and (*Z*)-cyclosuffrobuxinine-M (**16**) (CDCl_3 , 600 MHz) (*signals of compound **16**).

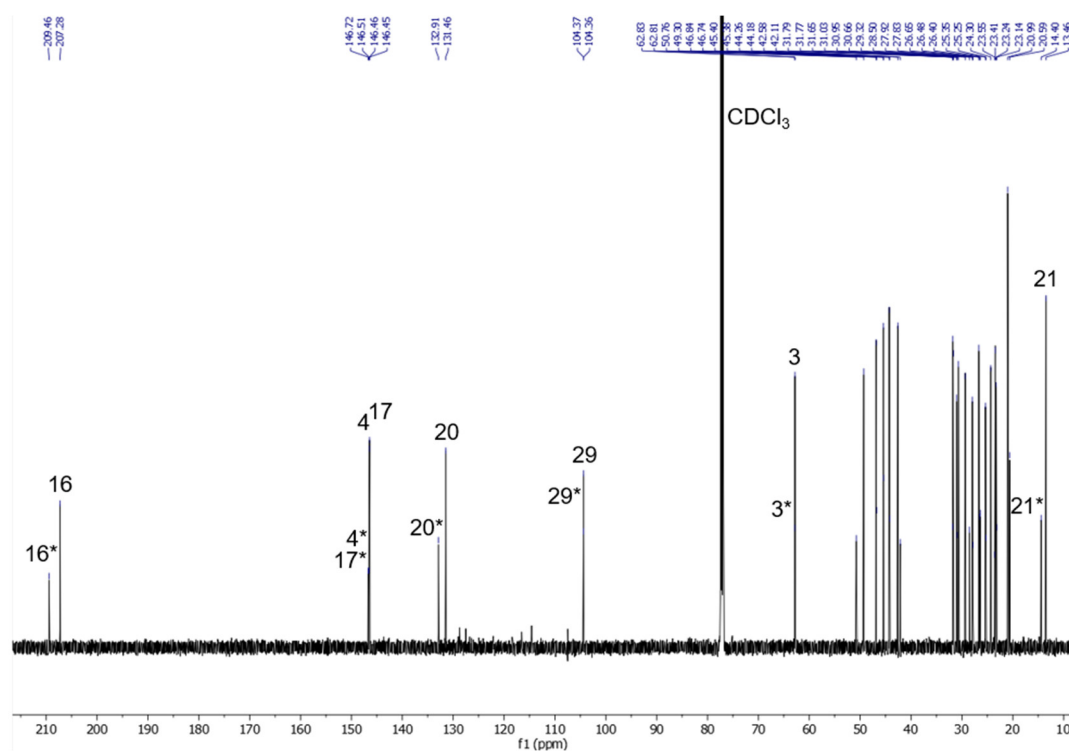


Figure S92. ^{13}C NMR spectrum of (*E*)-cyclosuffrobuxinine-M (**15**) and (*Z*)-cyclosuffrobuxinine-M (**16**) (CDCl_3 , 150 MHz). The assignment of the signals between 20 and 52 ppm can be found in the enlarged Figure S93 (*signals of compound **16**).

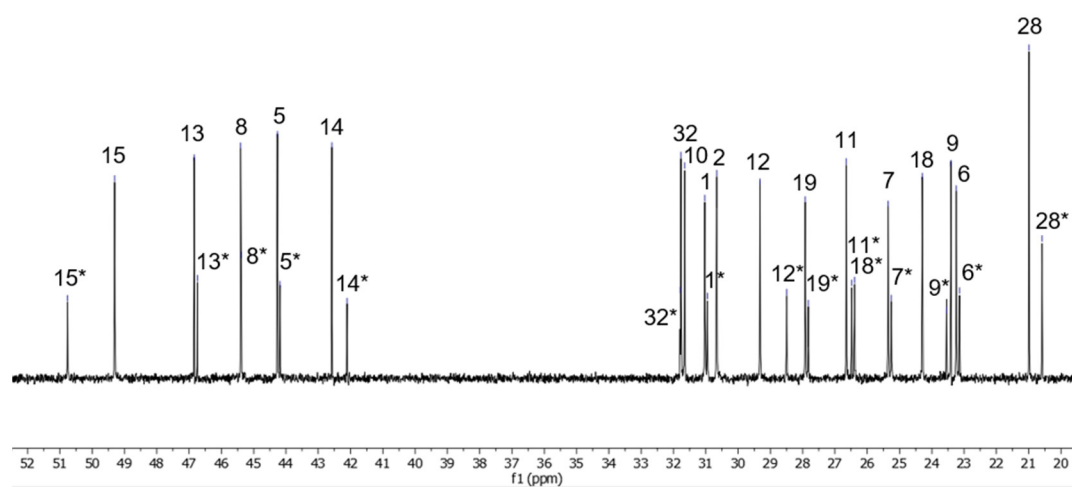


Figure S93. Detail of the ^{13}C NMR spectrum of (*E*)-cyclosuffrobuxinine-M (**15**) and (*Z*)-cyclosuffrobuxinine-M (**16**) (CDCl_3 , 150 MHz) (*signals of compound **16**).

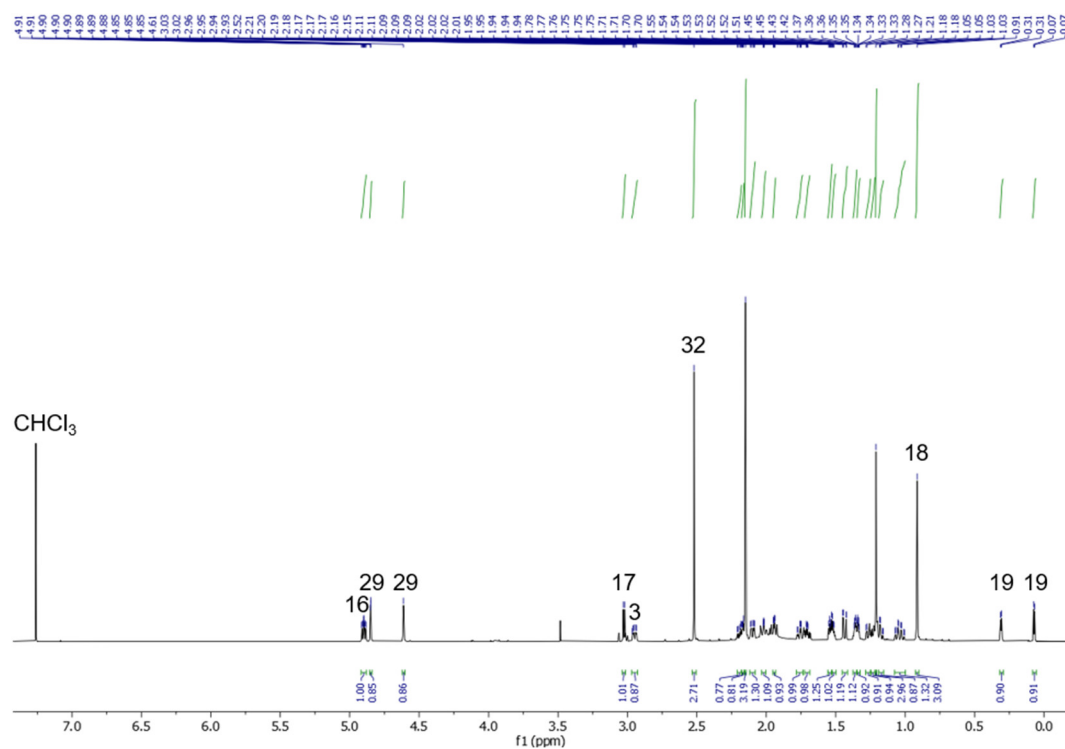


Figure S94. ^1H NMR spectrum of Cyclomicrobuxinine (**17**) (CDCl_3 , 600 MHz). The assignment of the signals between 1.0 and 2.2 ppm can be found in the enlarged Figure S95.

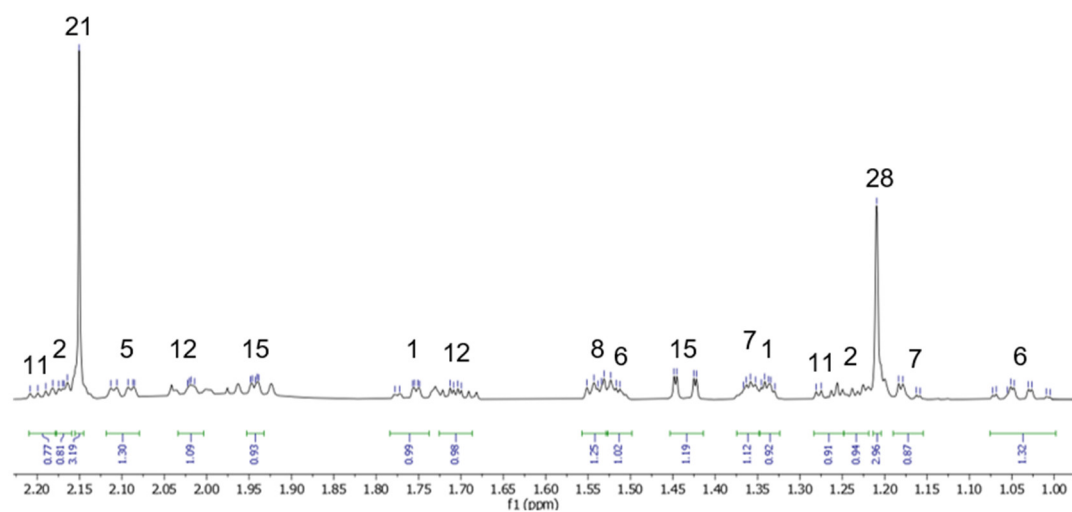


Figure S95. Detail of the ^1H NMR spectrum of Cyclomicrobuxinine (**17**) (CDCl_3 , 600 MHz).

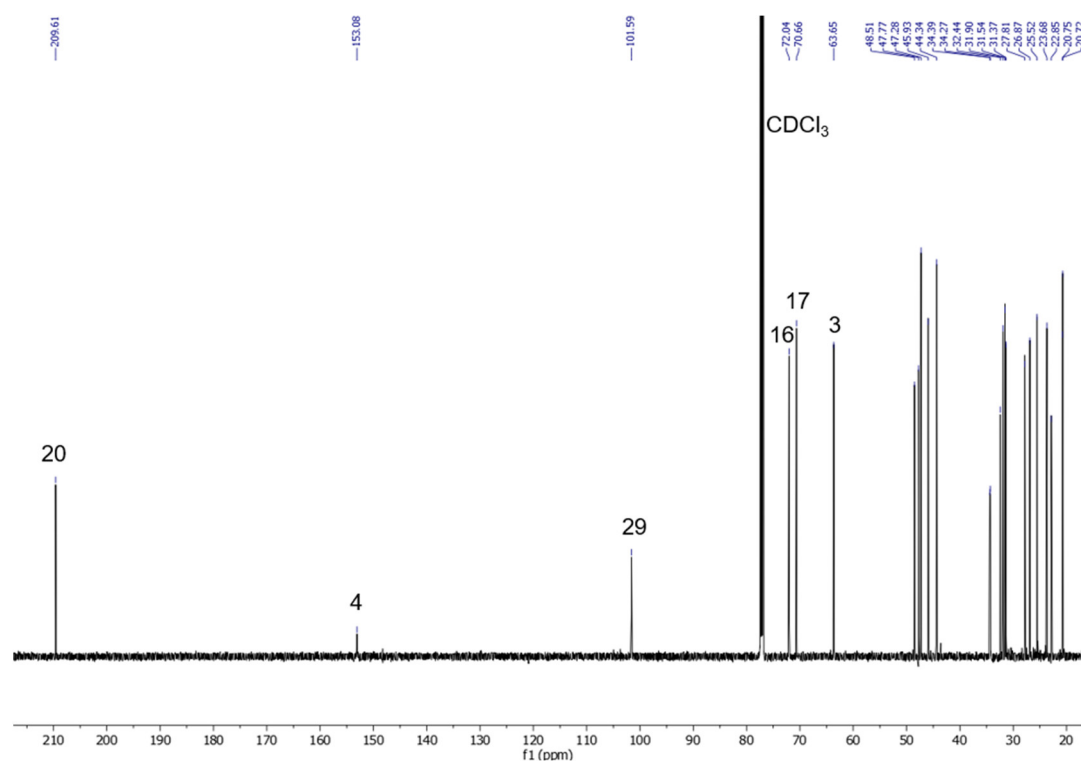


Figure S96. ¹³C NMR spectrum of Cyclomicrobuxinine (**17**) (CDCl₃, 150 MHz). The assignment of the signals between 20 and 49 ppm can be found in the enlarged Figure S97.

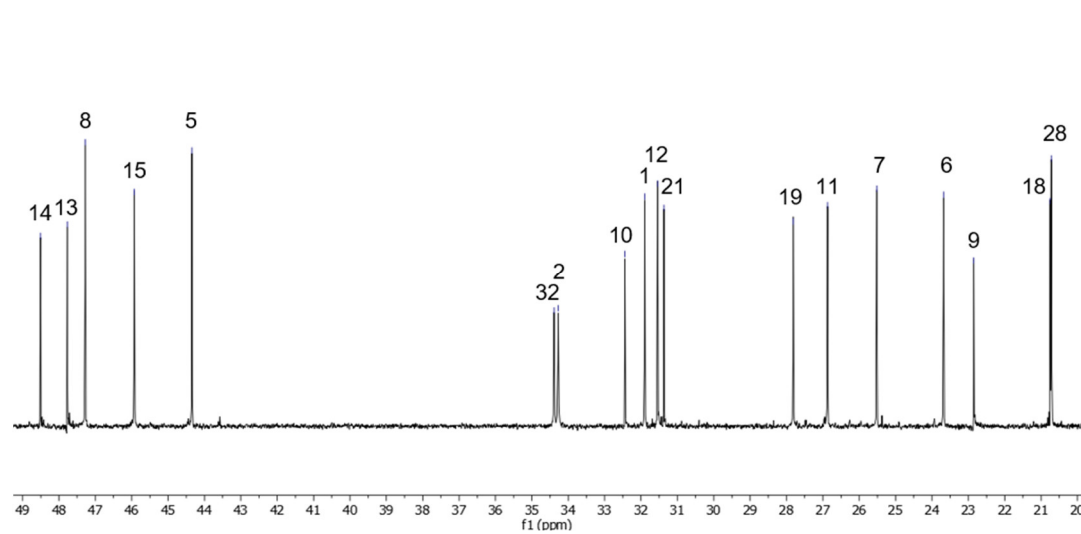


Figure S97. Detail of the ¹³C NMR spectrum of Cyclomicrobuxinine (**17**) (CDCl₃, 150 MHz).

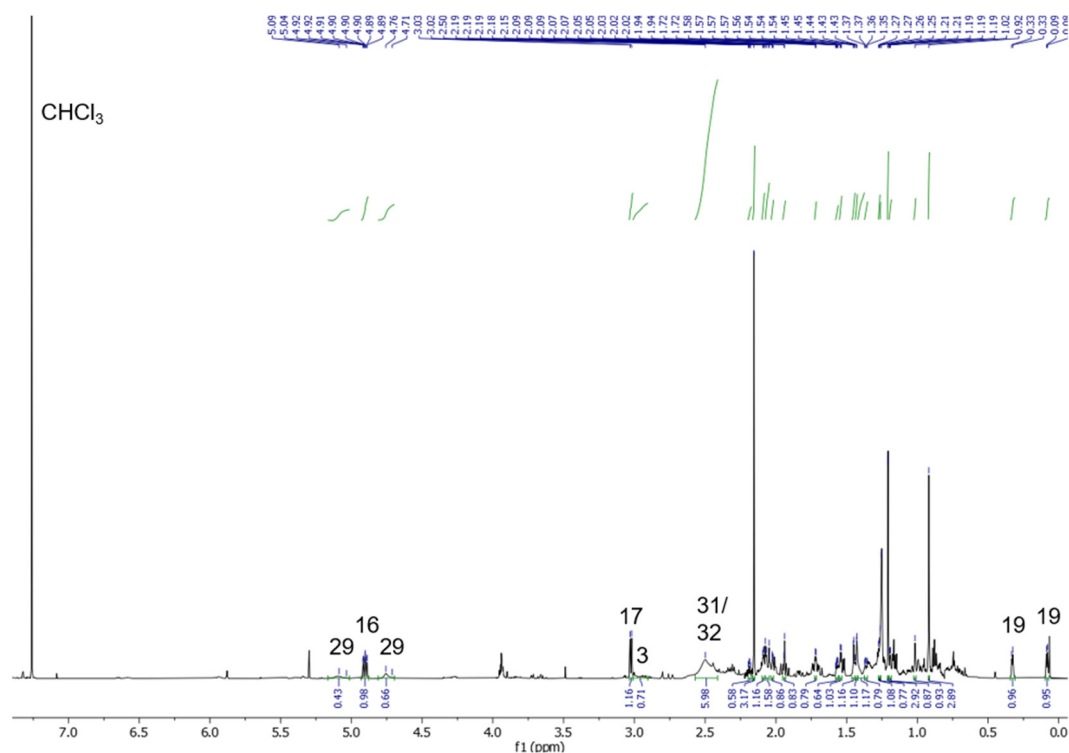


Figure S98. ^1H NMR spectrum of Cyclomicrobuxine (**18**) (CDCl_3 , 600 MHz). The assignment of the signals between 0.9 and 2.2 ppm can be found in the enlarged Figure S99.

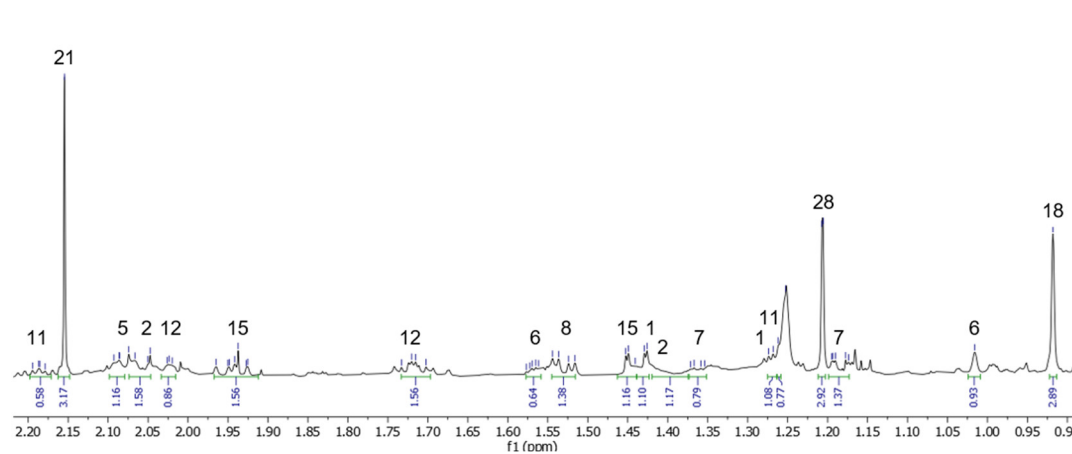


Figure S99. Detail of the ^1H NMR spectrum of Cyclomicrobuxine (**18**) (CDCl_3 , 600 MHz).

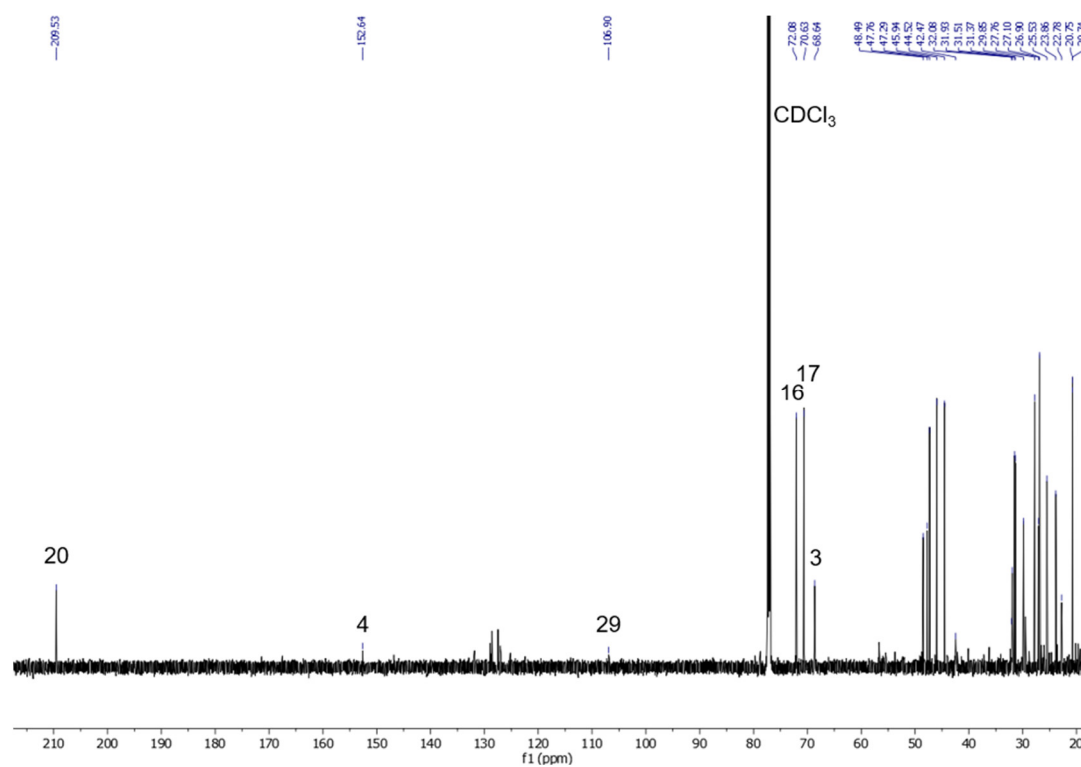


Figure S100. ^{13}C NMR spectrum of Cyclomicrobuxine (**18**) (CDCl_3 , 150 MHz). The assignment of the signals between 20.5 and 49 ppm can be found in the enlarged Figure S101.

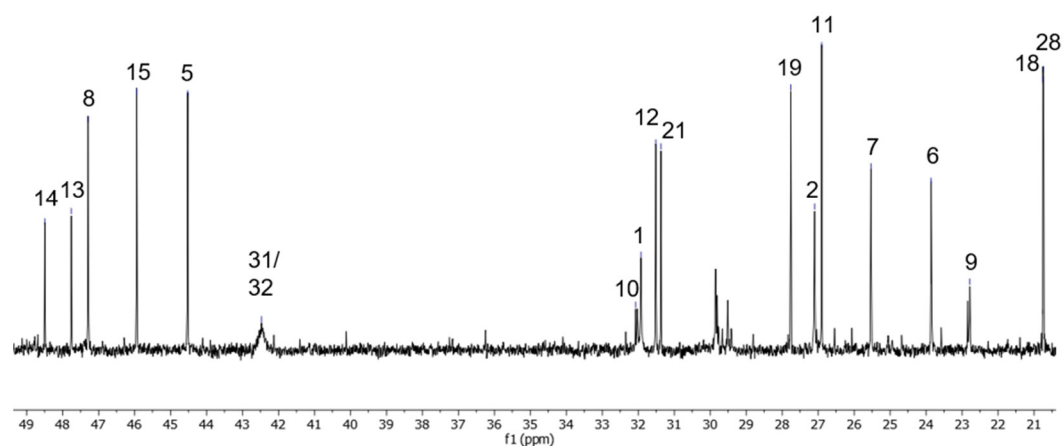


Figure S101. Detail of the ^{13}C NMR spectrum of Cyclomicrobuxine (**18**) (CDCl_3 , 150 MHz).

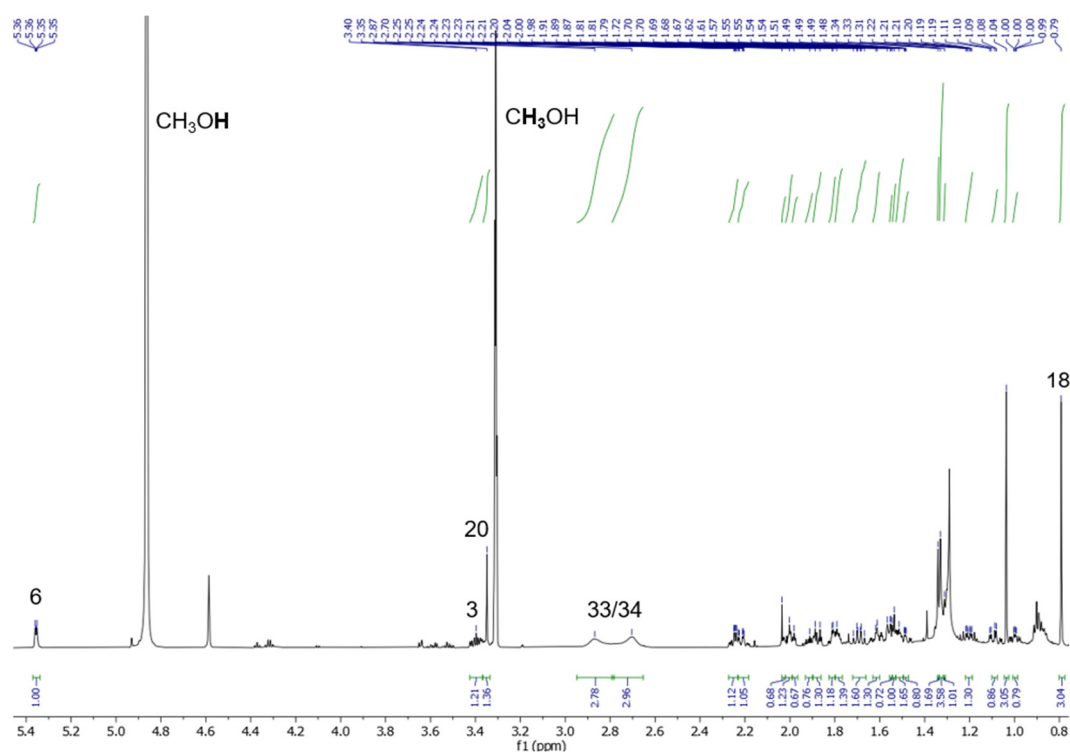


Figure S102. ^1H NMR spectrum of Irehine (**19**) (CD_3OD , 600 MHz). The assignment of the signals between 0.95 and 2.3 ppm can be found in the enlarged Figure S103.

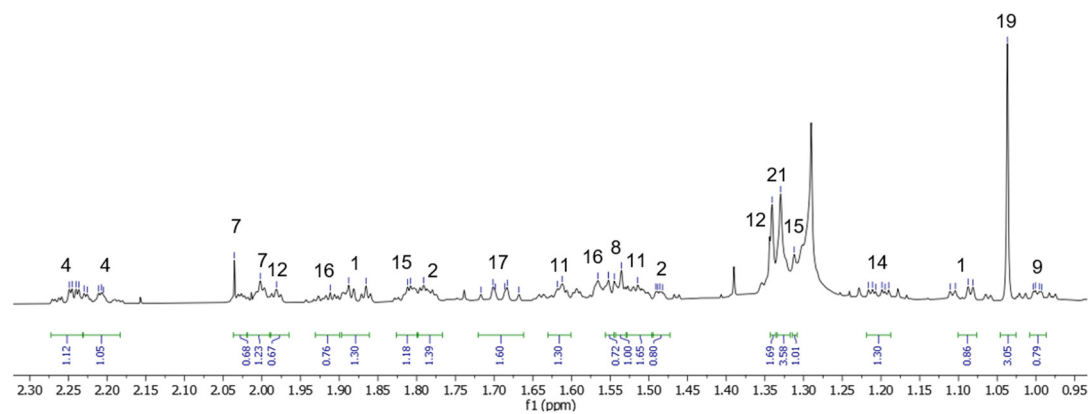


Figure S103. Detail of the ^1H NMR spectrum of Irehine (**19**) (CD_3OD , 600 MHz).

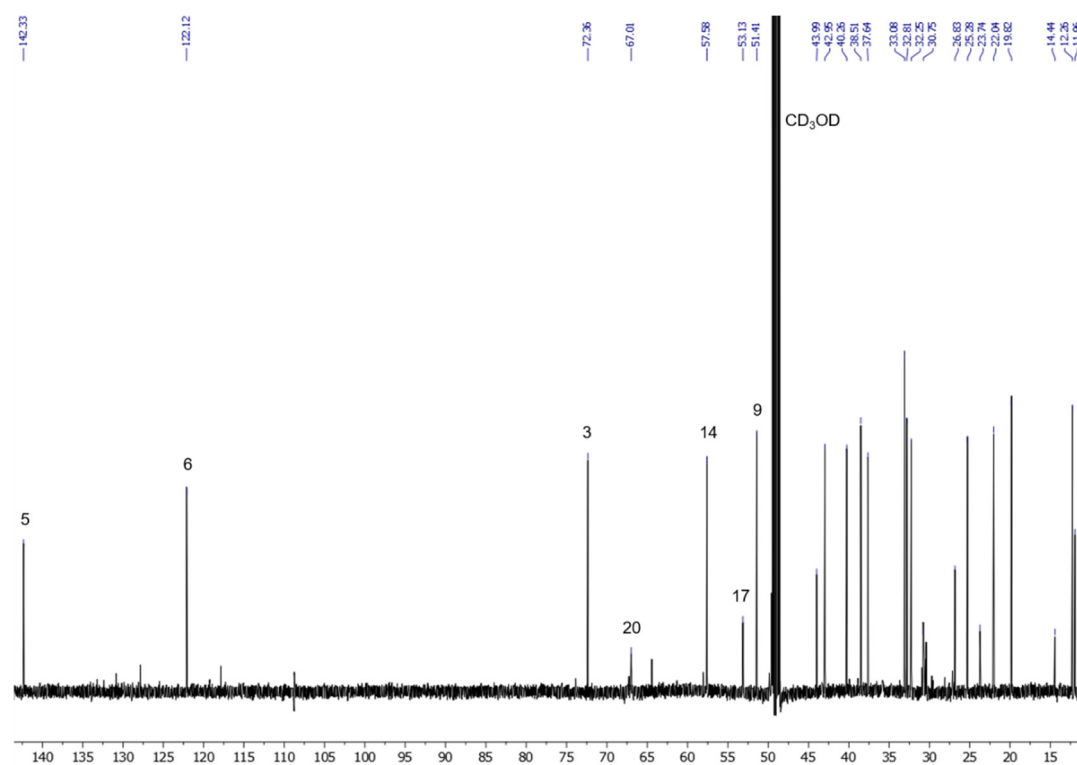


Figure S104. ^{13}C NMR spectrum of Irehine (**19**) (CD_3OD , 150 MHz). The assignment of the signals between 11 and 44 ppm can be found in the enlarged Figure S105.

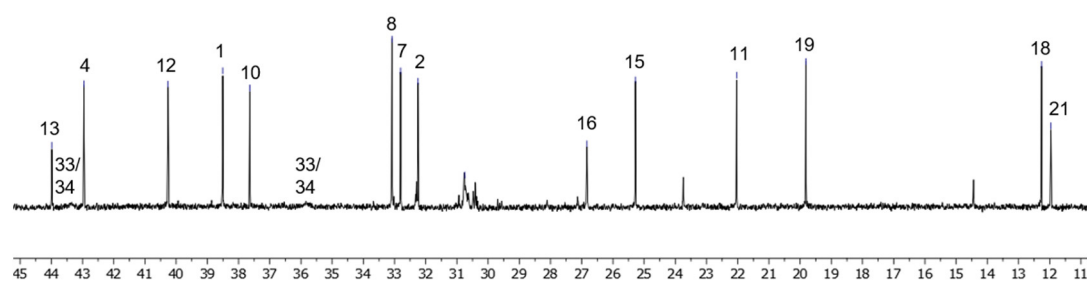


Figure S105. Detail of the ^{13}C NMR spectrum of Irehine (**19**) (CD_3OD , 150 MHz).

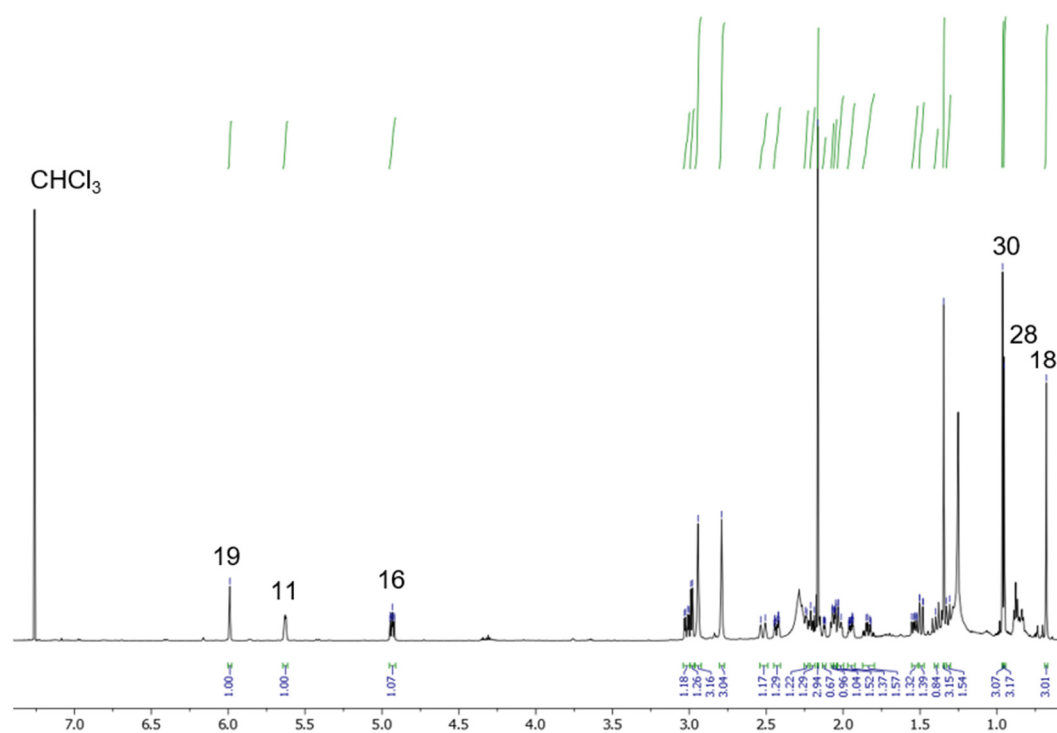


Figure S106. ^1H NMR spectrum of 16- α -hydroxybuxaminone (**20**) (CDCl_3 , 600 MHz). The assignment of the signals between 1.3 and 3.0 ppm can be found in the enlarged Figure S107.

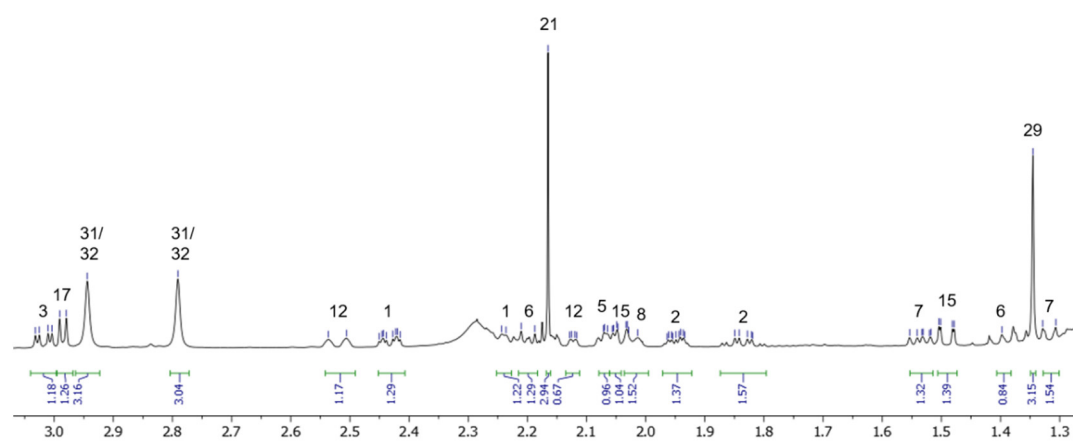
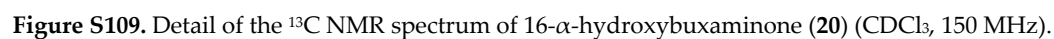
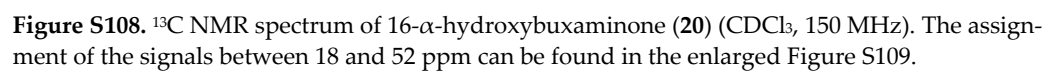


Figure S107. Detail of the ^1H NMR spectrum of 16- α -hydroxybuxaminone (**20**) (CDCl_3 , 600 MHz).



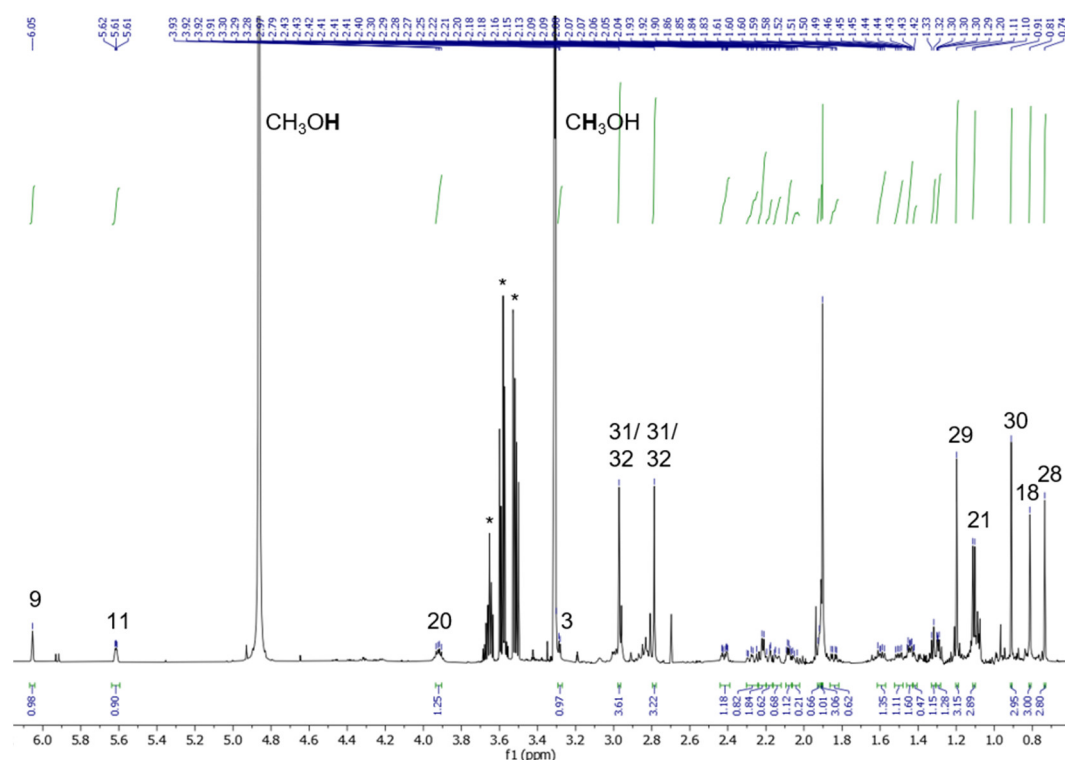


Figure S110. ^1H NMR spectrum of N_{20} -acetylbuxamine-E (**21**) (CD_3OD , 600 MHz). The assignment of the signals between 1.25 and 2.45 ppm can be found in the enlarged Figure S111 (*signals of 36.4% glycerol).

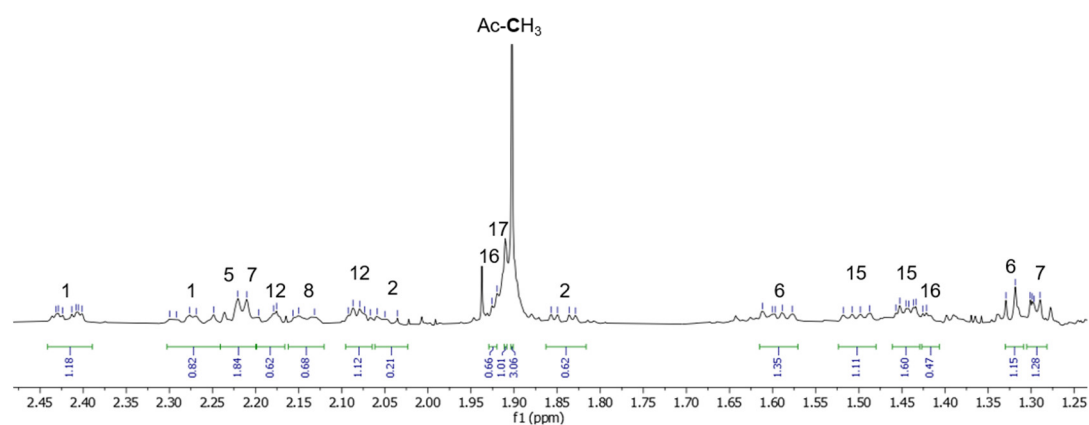


Figure S111. Detail of the ^1H NMR spectrum of N_{20} -acetylbuxamine-E (**21**) (CD_3OD , 600 MHz).

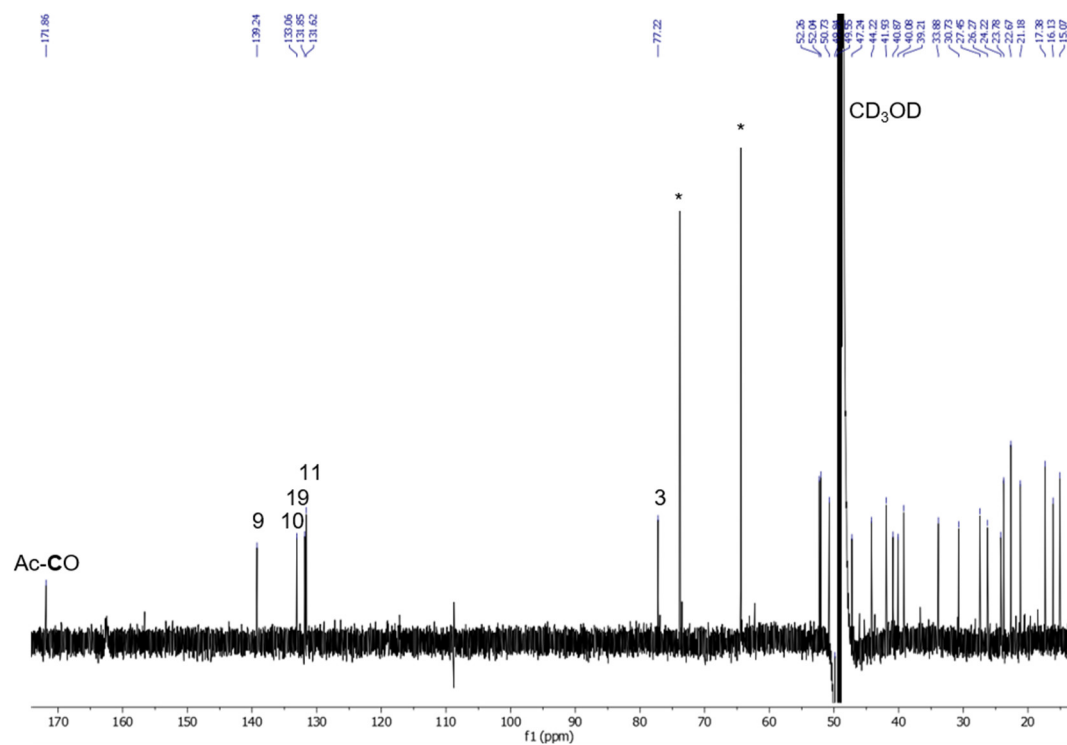


Figure S112. ^{13}C NMR spectrum of N_{20} -acetylbuxamine-E (**21**) (CD_3OD , 150 MHz). The assignment of the signals between 15 and 53 ppm can be found in the enlarged Figure S113 (*signals of 36.4% glycerol).

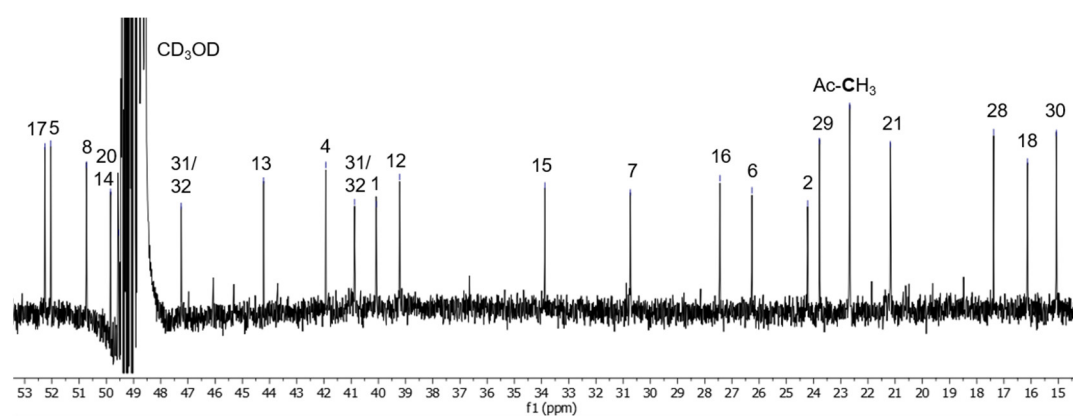


Figure S113. Detail of the ^{13}C NMR spectrum of N_{20} -acetylbuxamine-E (**21**) (CD_3OD , 150 MHz).

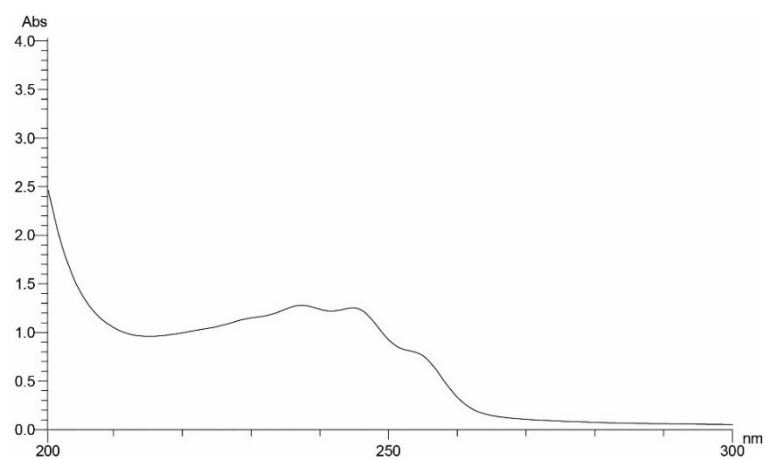


Figure S114. UV spectrum of N-benzoyl-O-acetylboxodienine-E (**22**) ($c = 0.02$ mg/mL) in methanol; λ_{max} (log ϵ): 237 nm (4.54), 245 nm (4.53), 253 nm (4.35).

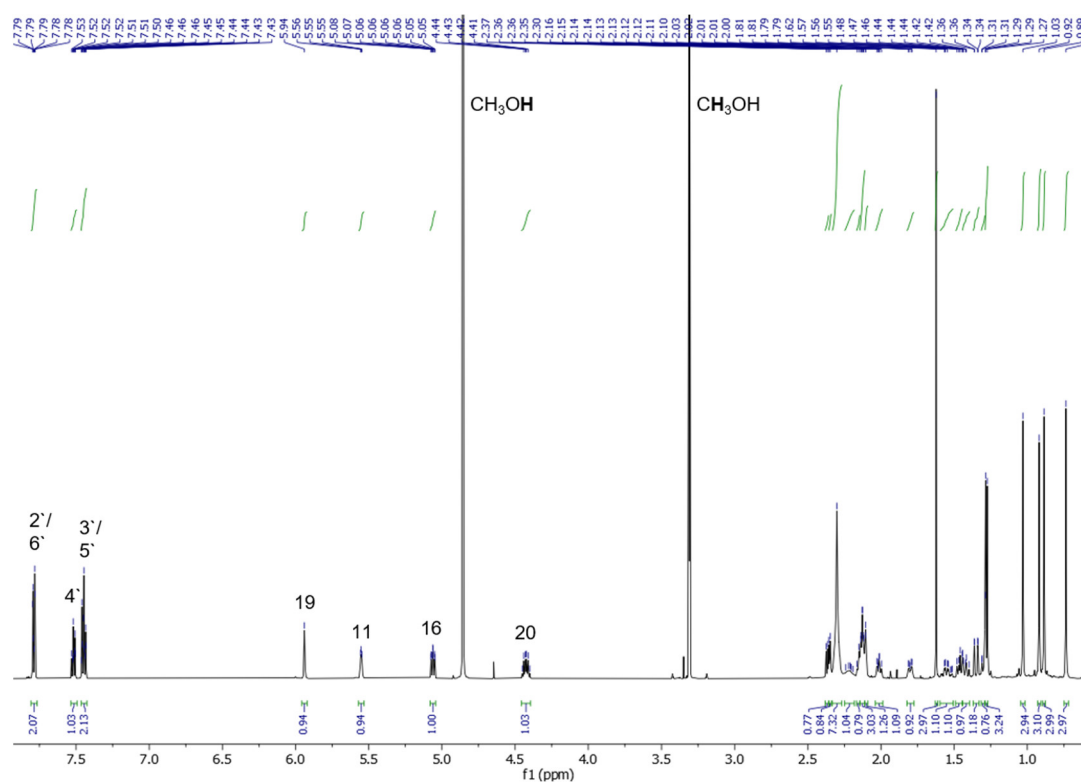


Figure S115. ^1H NMR spectrum of N-benzoyl-O-acetylboxodienine-E (**22**) (CD_3OD , 600 MHz). The assignment of the signals between 0.6 and 2.5 ppm can be found in the enlarged Figure S116.

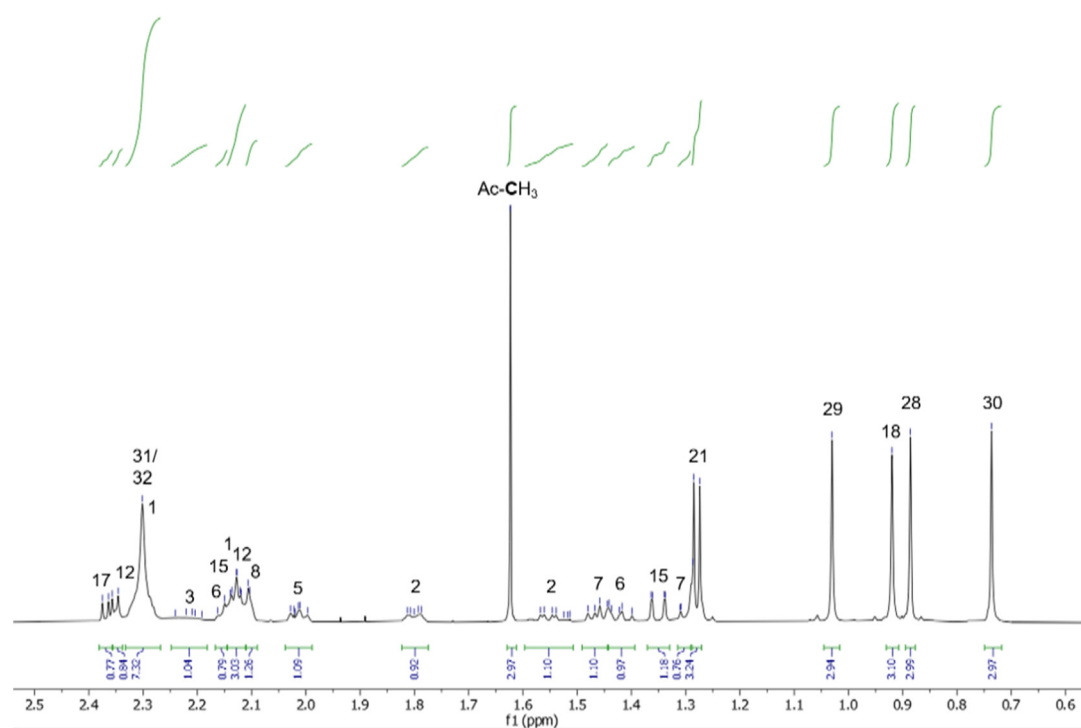


Figure S116. Detail of the ^1H NMR spectrum of N-benzoyl-O-acetylbuxodienine-E (22) (CD_3OD , 600 MHz).

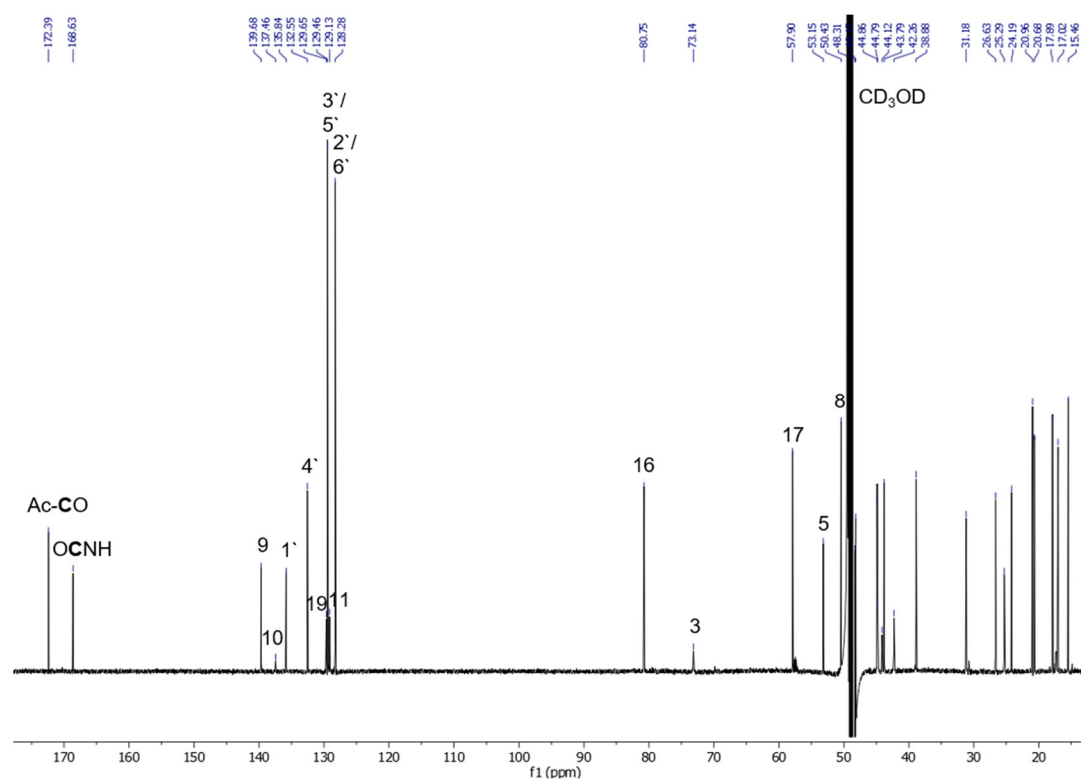


Figure S117. ^{13}C NMR spectrum of N-benzoyl-O-acetylbuxodienine-E (22) (CD_3OD , 150 MHz). The assignment of the signals between 15 and 49 ppm can be found in the enlarged Figure S118.

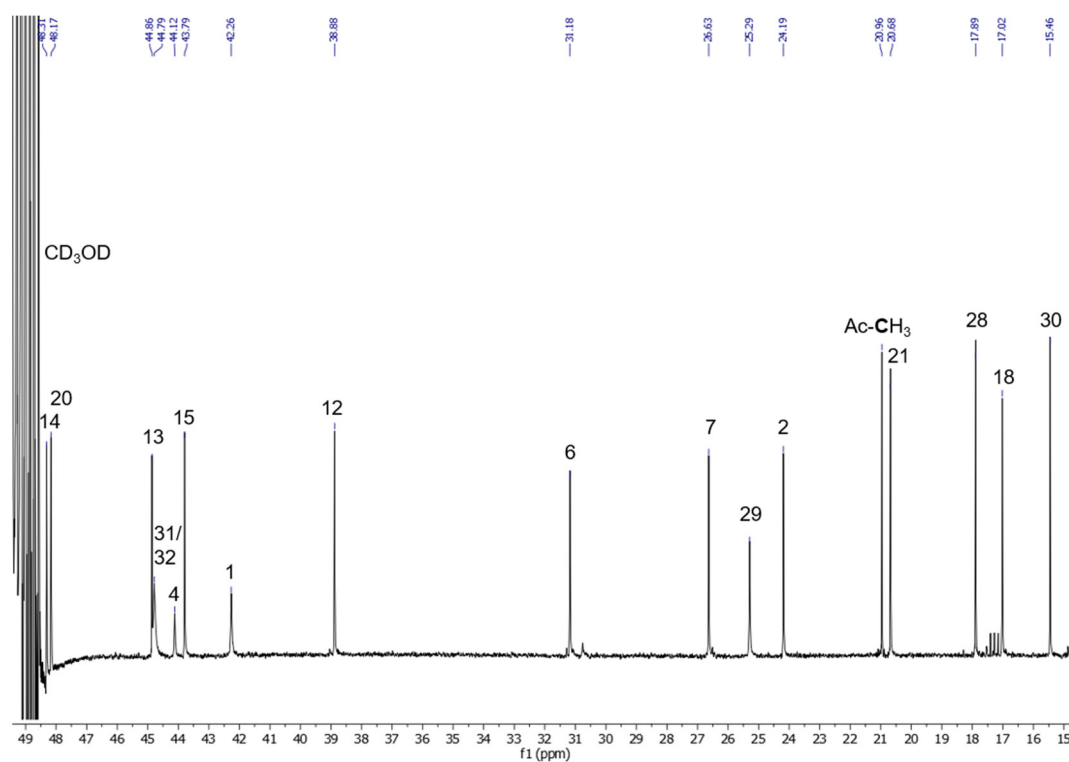


Figure S118. Detail of the ^{13}C NMR spectrum of N-benzoyl-O-acetylbuxodienine-E (22) (CD_3OD , 150 MHz).

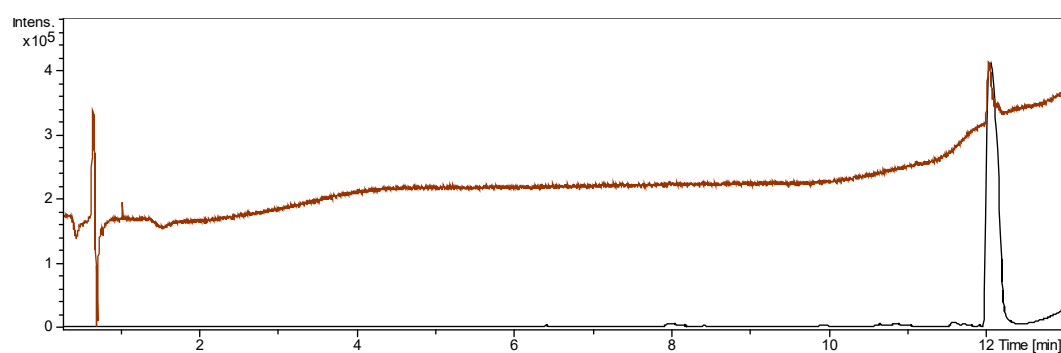


Figure S119. UHPLC/+ESI-QqTOF-MS/MS chromatogram of N-benzoyl-O-acetylbuxadine-E (23). Base peak chromatogram 200.0000-1000.0000 +All MS (black); UV-Chromatogram, 200-400 nm (red).

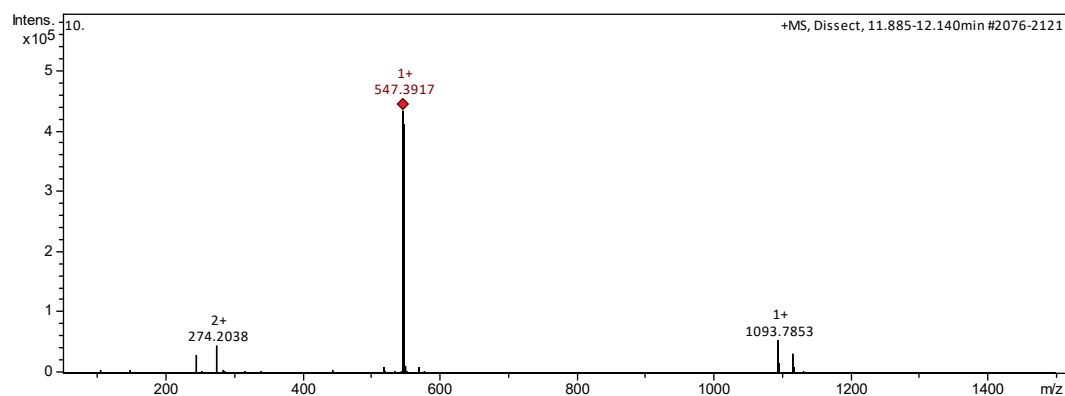


Figure S120. +ESI-QqTOF MS spectrum of N-benzoyl-O-acetylbuxadine-E (23); m/z 274.2038 $[M+2H]^{2+}$, 547.3917 $[M+H]^+$ and 1093.7853 $[2M+H]^+$.

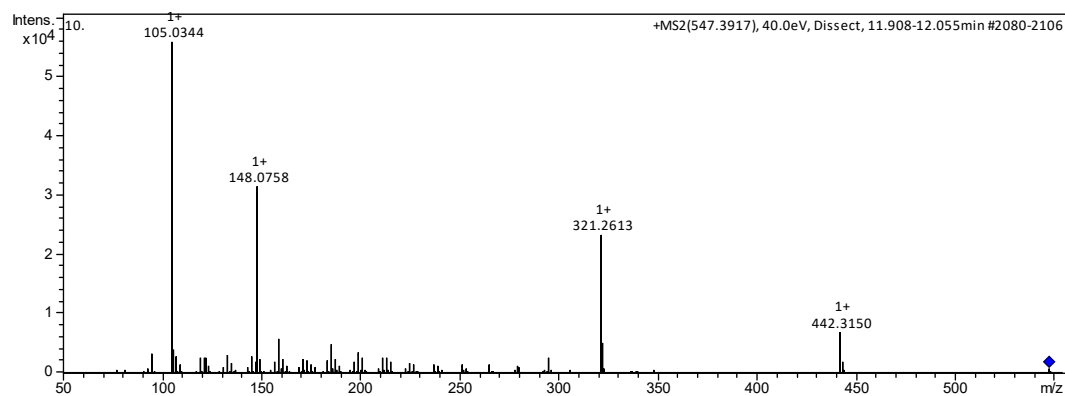


Figure S121. +ESI-QqTOF MS/MS spectrum of N-benzoyl-O-acetylbuxadine-E (23).

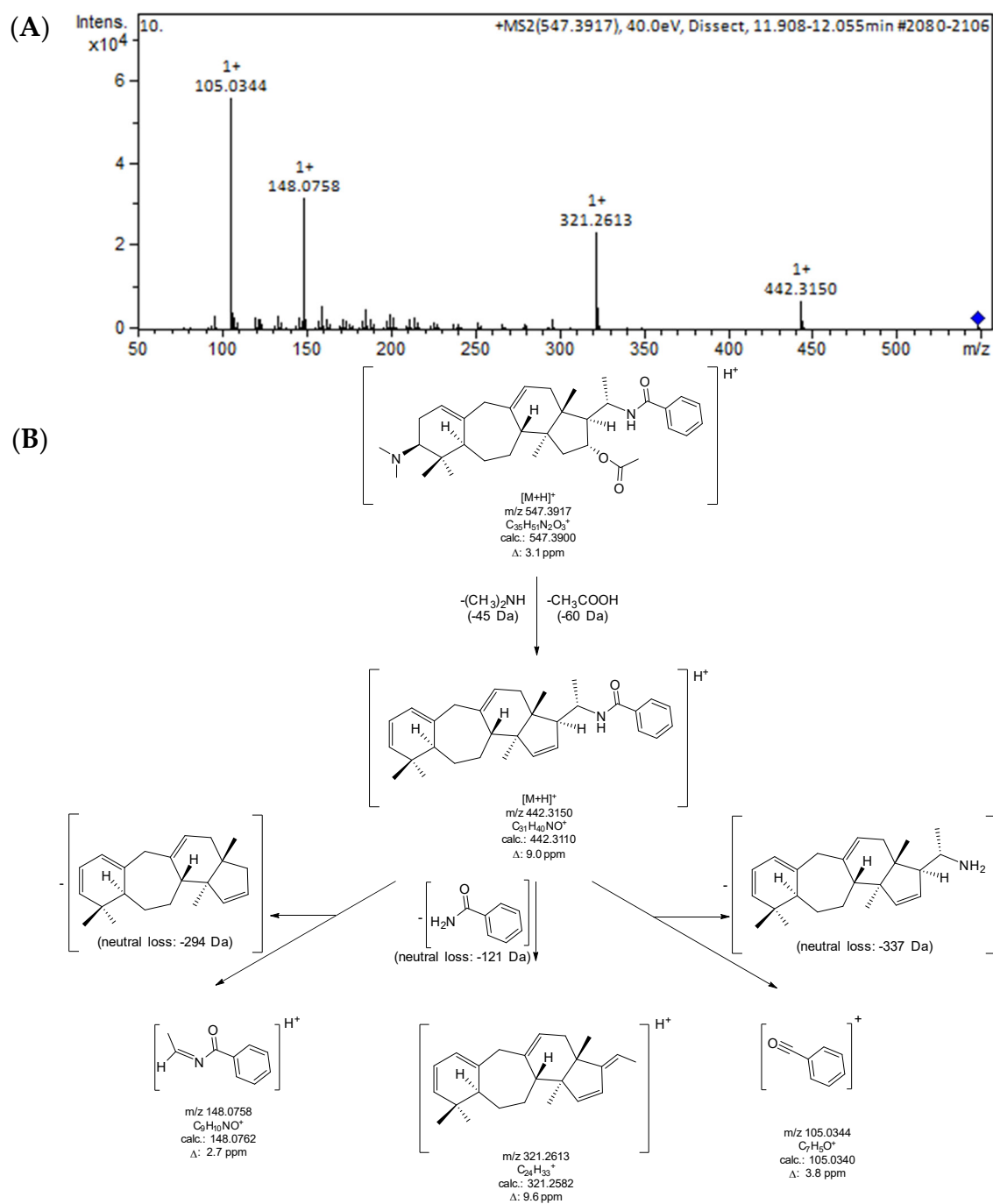


Figure S122. (A) +ESI MS/MS spectrum (CID 40 eV). (B) fragments and possible fragmentation pathway of the $[M+H]^+$ ion of N-benzoyl-O-acetylbuxadine-E (23).

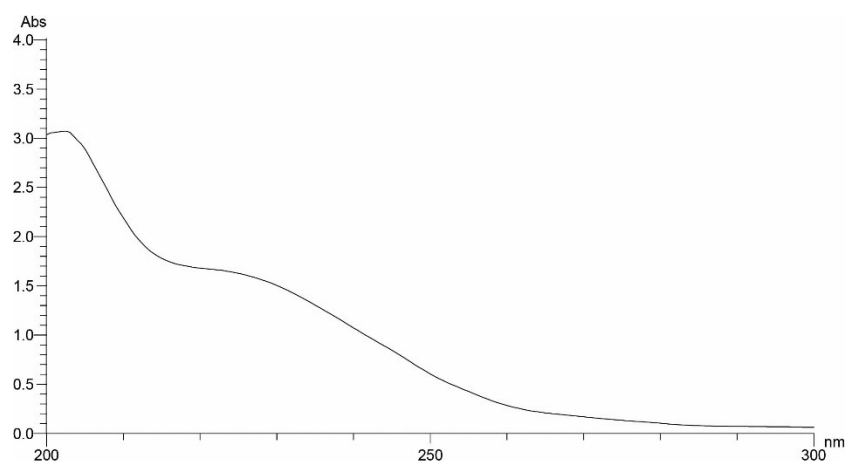


Figure S123. UV spectrum of N-benzoyl-O-acetylbuxadine-E (**23**) ($c = 0.086$ mg/mL) in methanol; λ_{\max} ($\log \epsilon$): 225 nm (4.01).

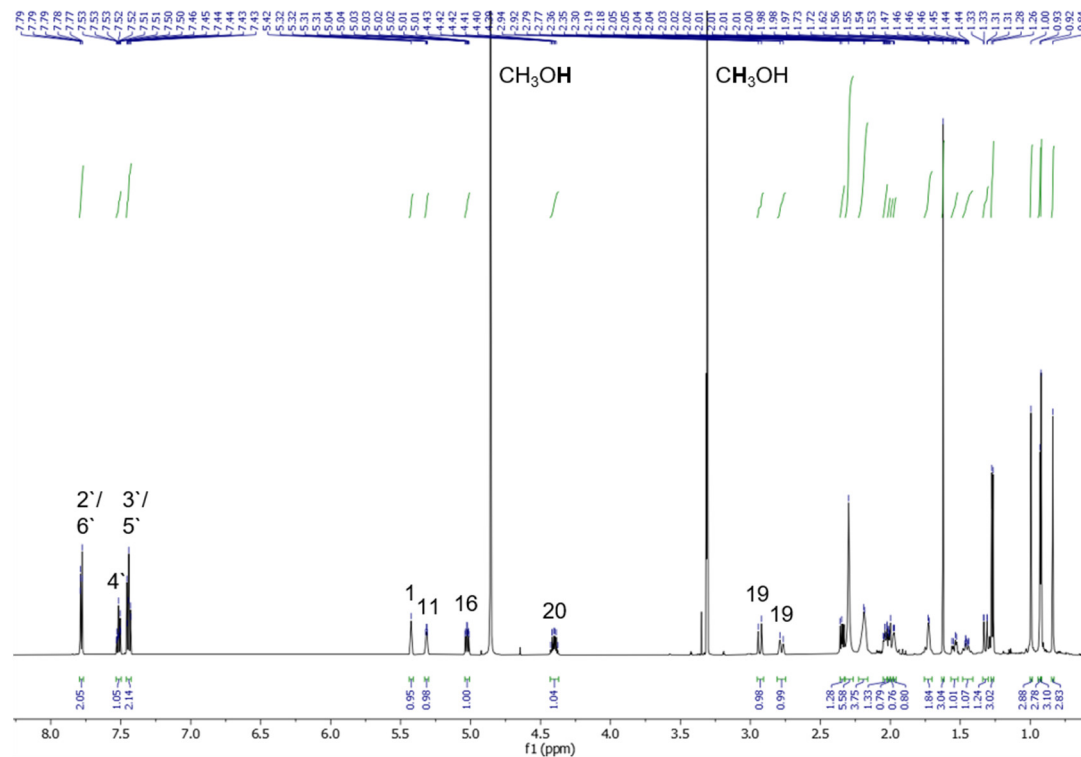


Figure S124. ^1H NMR spectrum of N-benzoyl-O-acetylbuxadine-E (**23**) (CD_3OD , 600 MHz). The assignment of the signals between 0.8 and 2.4 ppm can be found in the enlarged Figure S125.

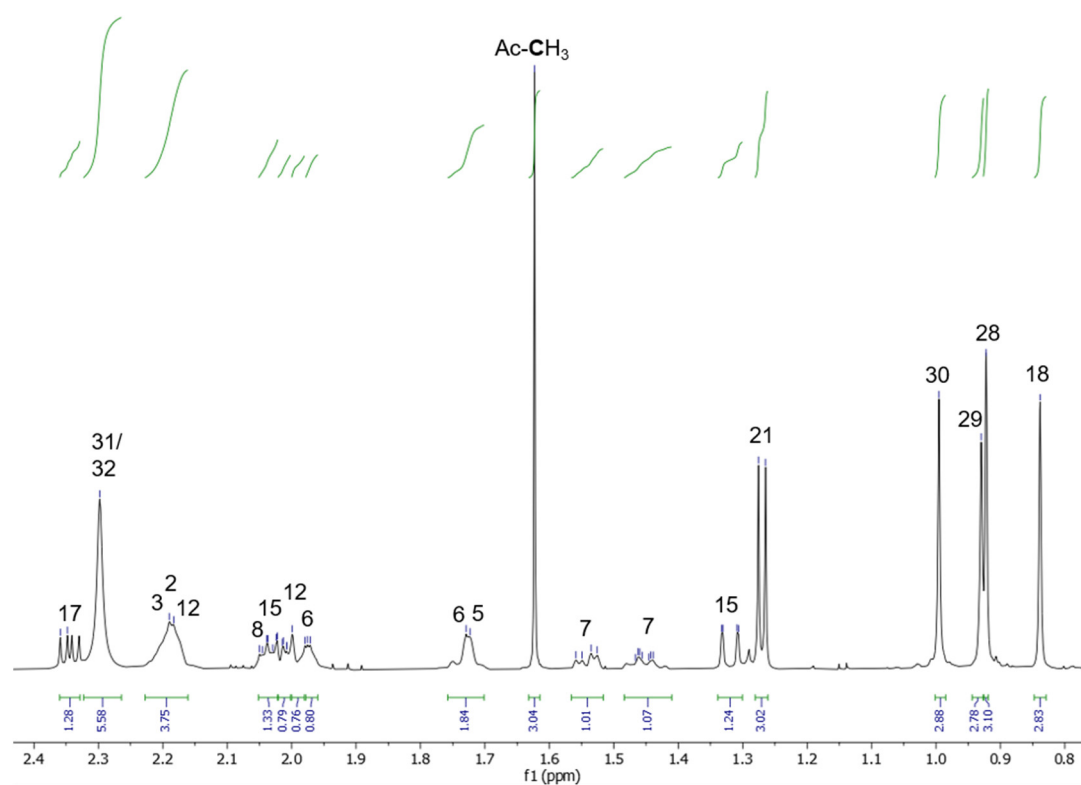


Figure S125. Detail of the ^1H NMR spectrum of N-benzoyl-O-acetylbuxadine-E (23) (CD_3OD , 600 MHz).

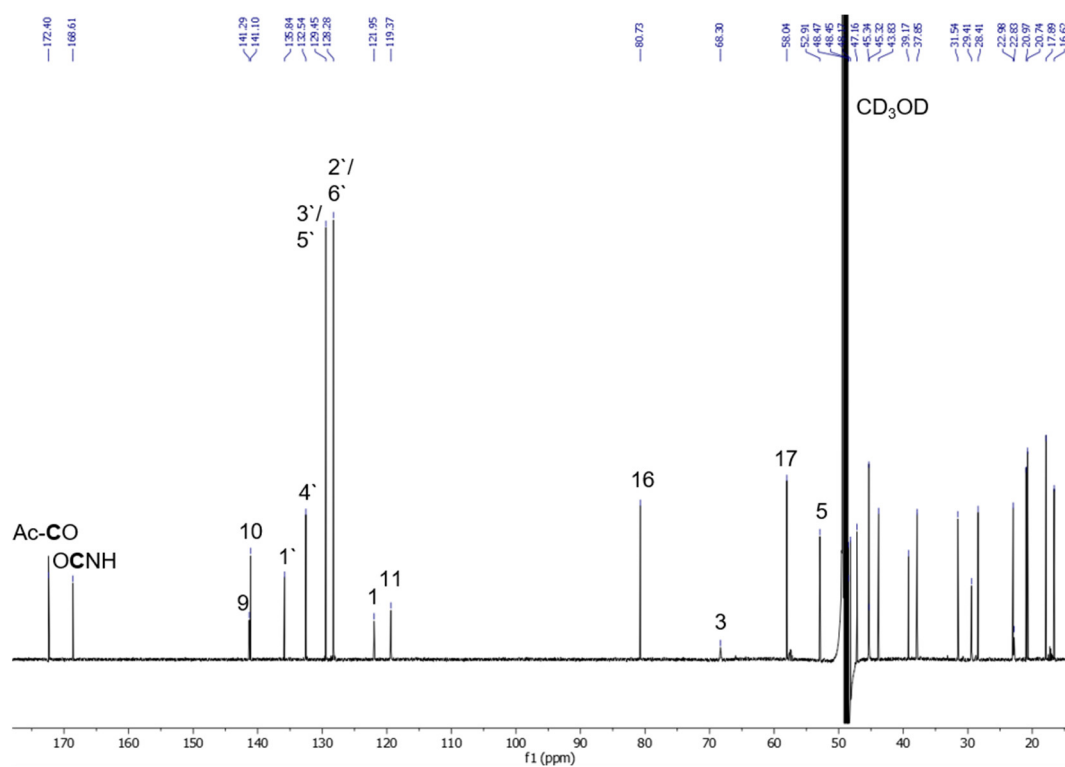


Figure S126. ^{13}C NMR spectrum of N-benzoyl-O-acetylbuxadine-E (23) (CD_3OD , 150 MHz). The assignment of the signals between 16 and 49 ppm can be found in the enlarged Figure S127.

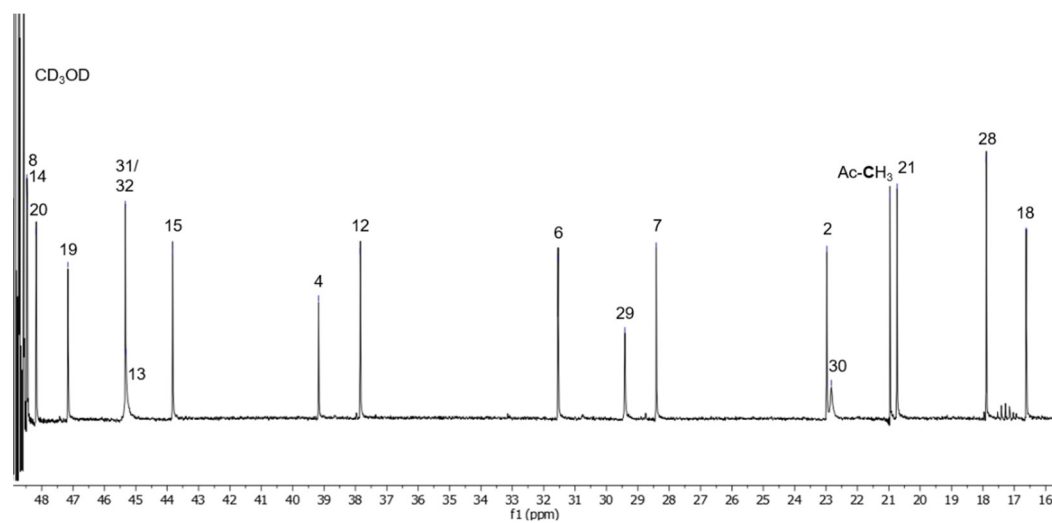


Figure S127. Detail of the ^{13}C NMR spectrum of N-benzoyl-O-acetylbuxadine-E (23) (CD_3OD , 150 MHz).

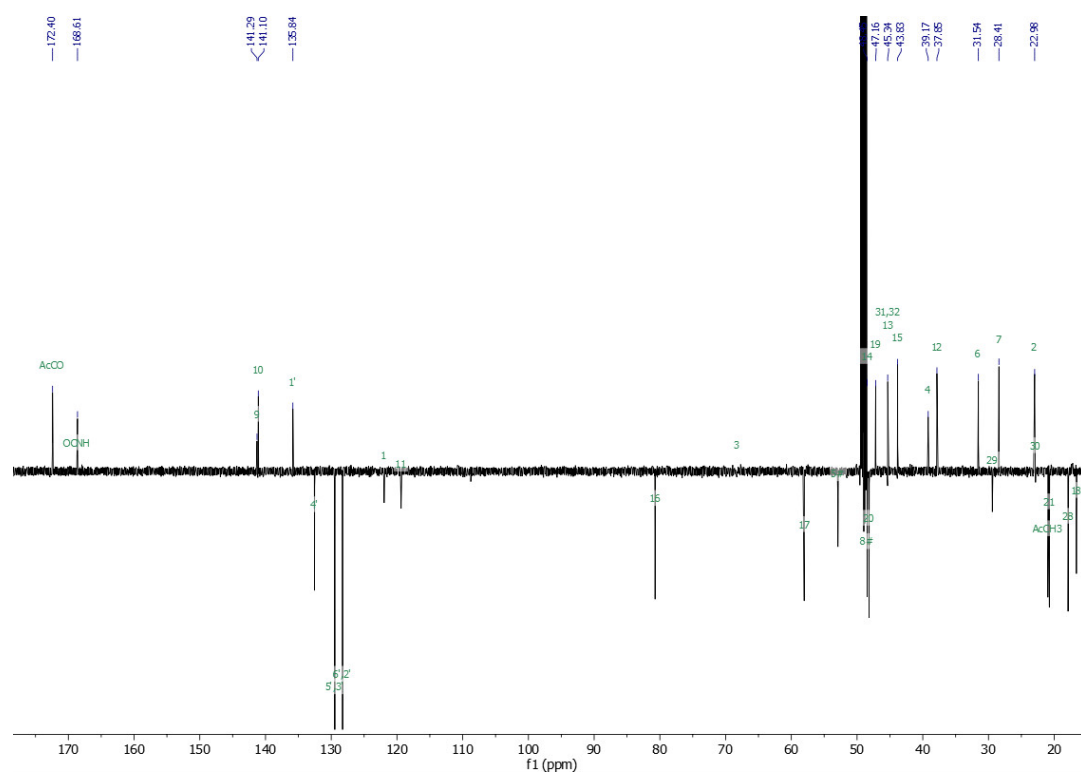


Figure S128. ^{13}C APT spectrum of N-benzoyl-O-acetylbuxadine-E (23) (CD_3OD , 150 MHz).

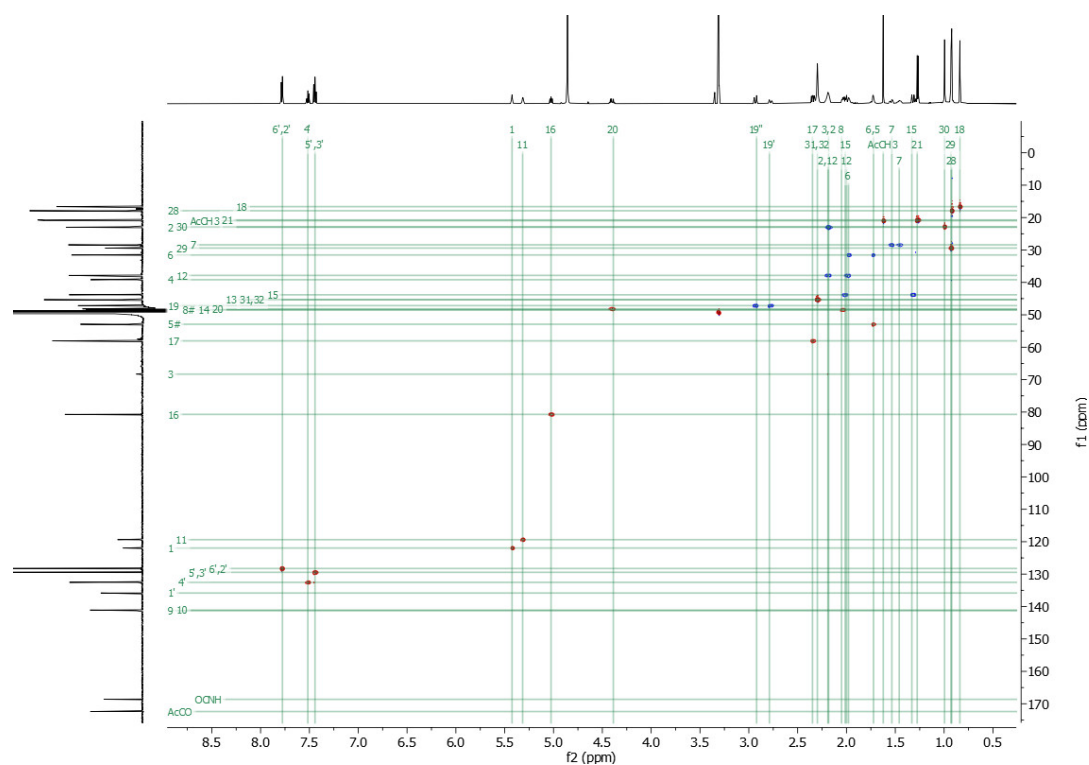


Figure S129. $^1\text{H}/^{13}\text{C}$ HSQC spectrum of N-benzoyl-O-acetylbuxadine-E (**23**) (CD_3OD , 600/150 MHz).

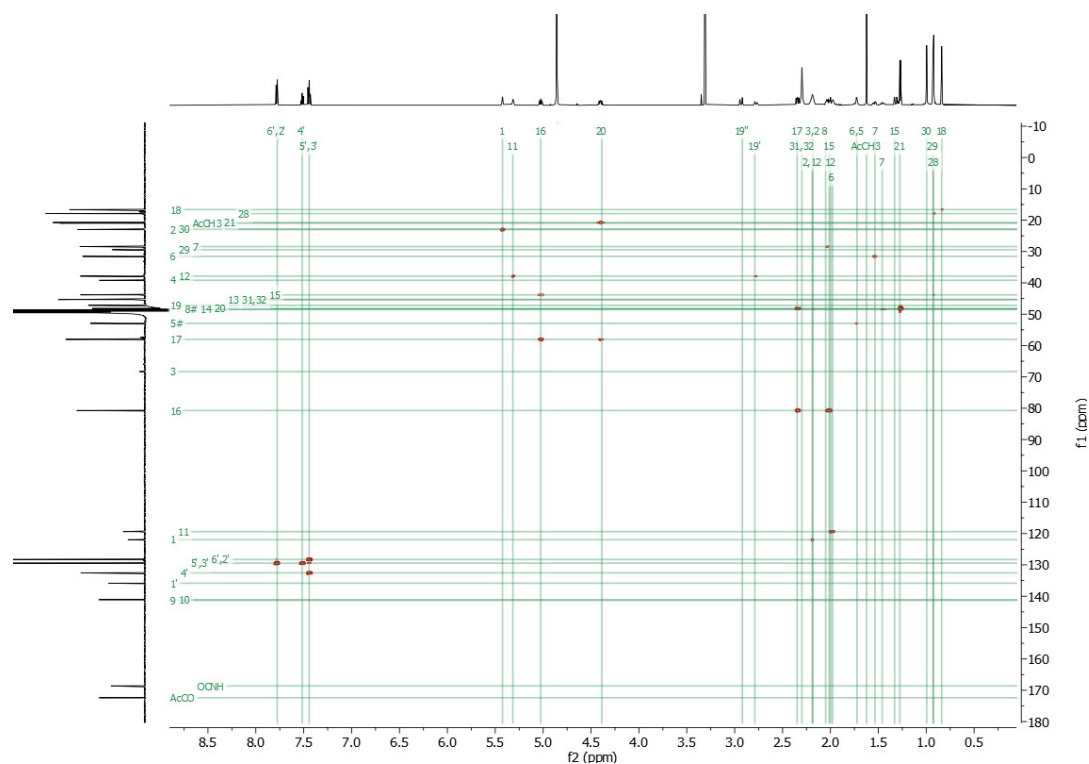


Figure S130. $^1\text{H}/^{13}\text{C}$ H2BC spectrum of N-benzoyl-O-acetylbuxadine-E (**23**) (CD_3OD , 600/150 MHz).

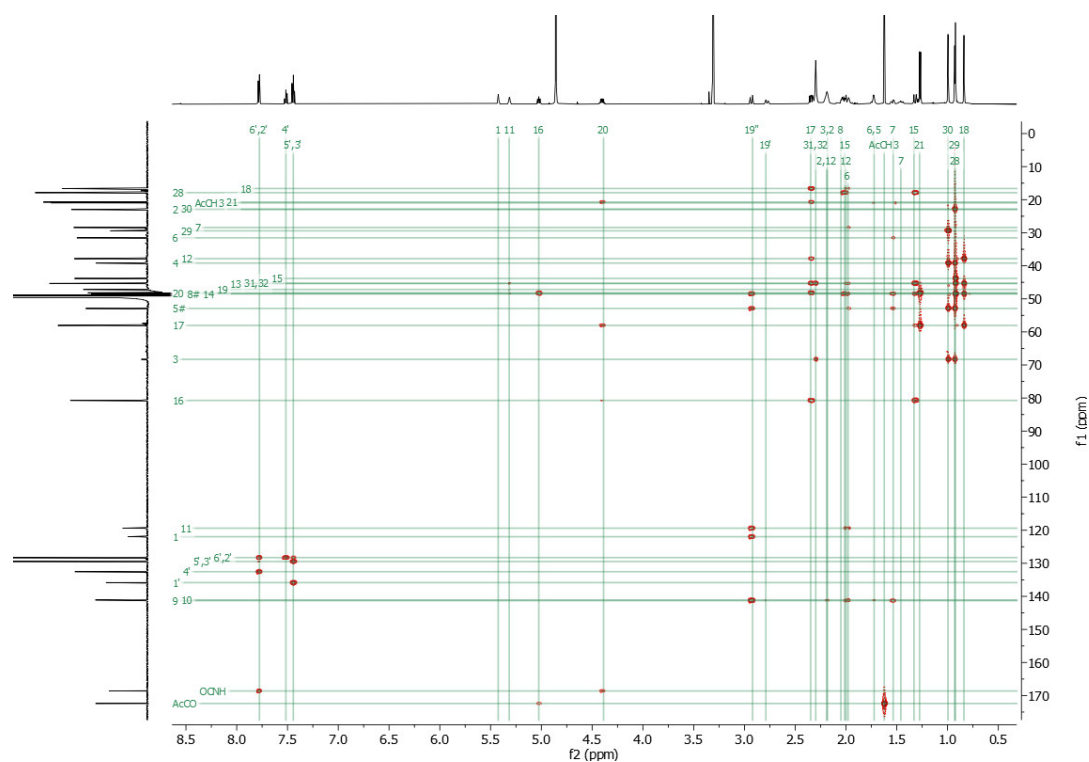


Figure S131. $^1\text{H}/^{13}\text{C}$ HMBC spectrum of N-benzoyl-O-acetylbuxadine-E (**23**) (CD_3OD , 600/150 MHz).

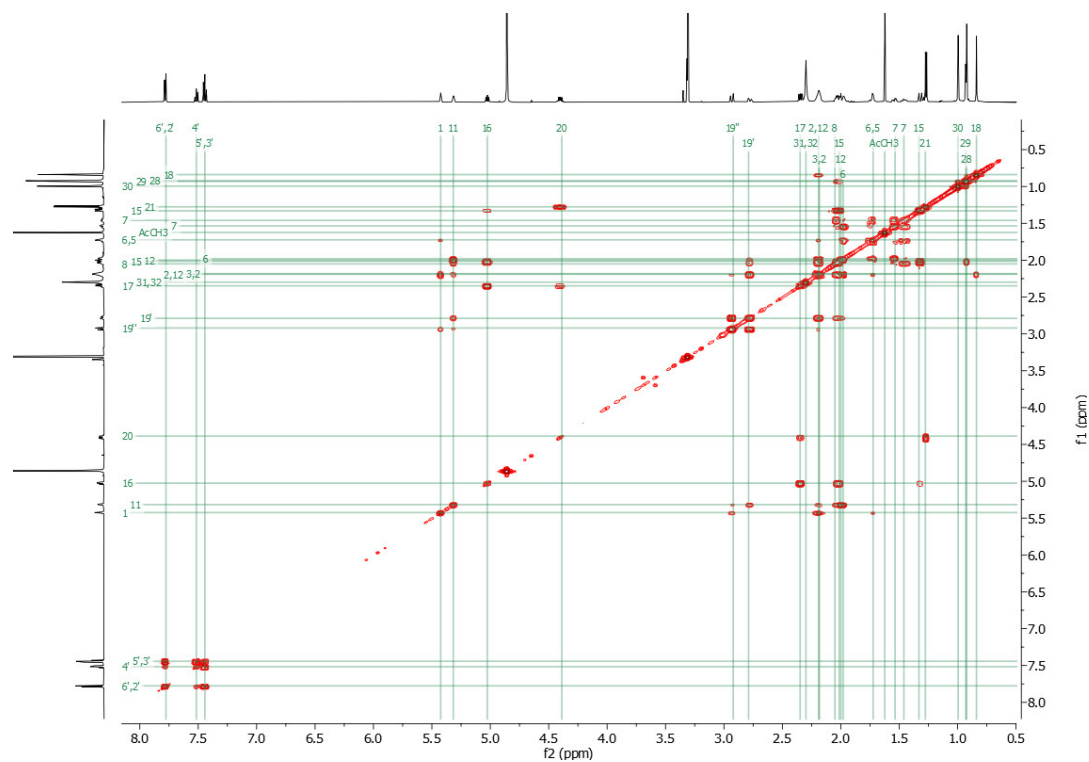


Figure S132. $^1\text{H}/^1\text{H}$ COSY spectrum of N-benzoyl-O-acetylbuxadine-E (**23**) (CD_3OD , 600 MHz).

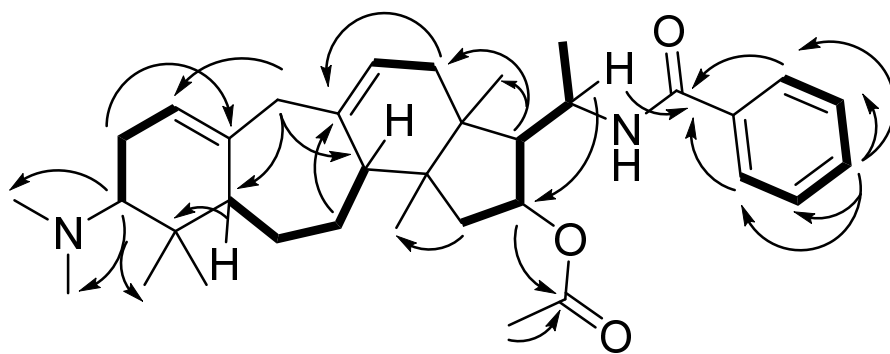


Figure S133. Key COSY (bold lines) and HMBC (arrows) correlations of N-benzoyl-O-acetylbuxadine-E (23).

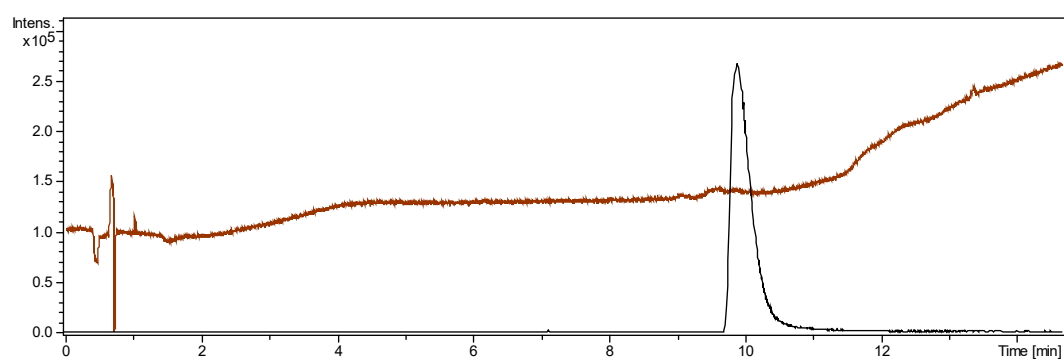


Figure S134. UHPLC/ESI-QqTOF-MS/MS chromatogram of N₂₀-acetylbuxadine-G (24). Base peak chromatogram 200.0000-1000.0000 +All MS (black); UV-Chromatogram, 200-400 nm (red).

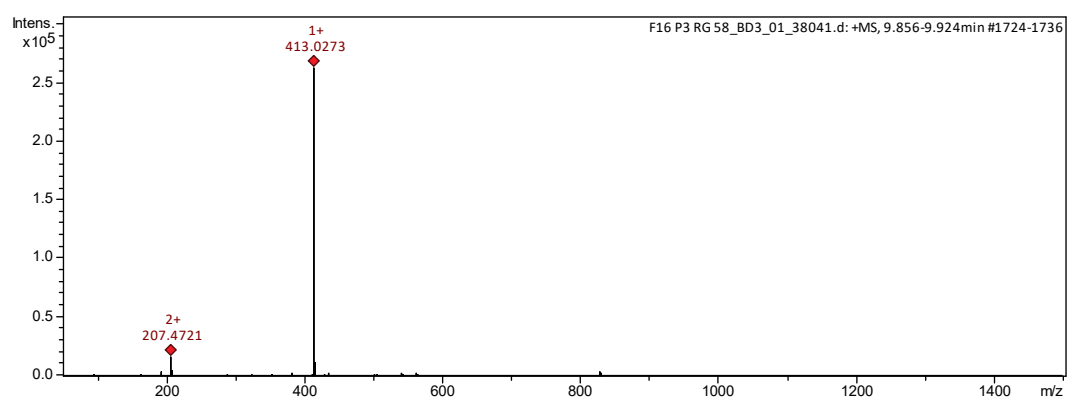


Figure S135. +ESI-QqTOF MS spectrum of N₂₀-acetylbuxadine-G (24); m/z 207.4721 [M+2H]²⁺ and 413.0273 [M+H]⁺.

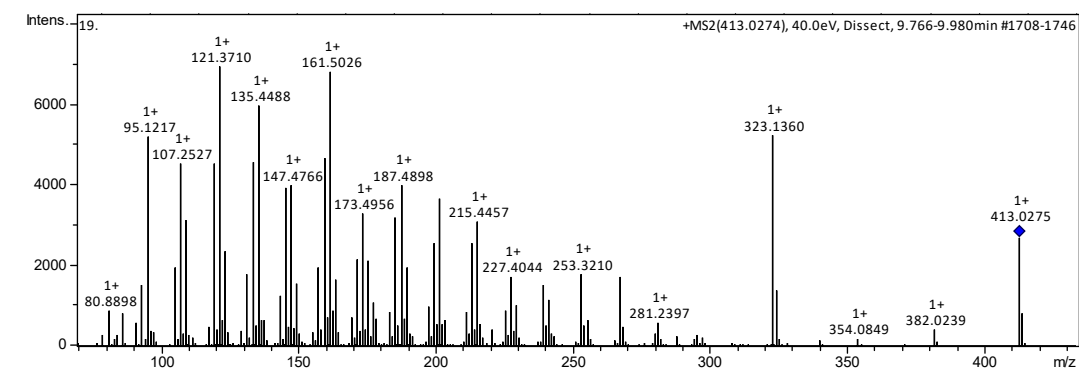


Figure S136. +ESI-QqTOF MS/MS spectrum of N₂₀-acetylbuxadine-G (24).

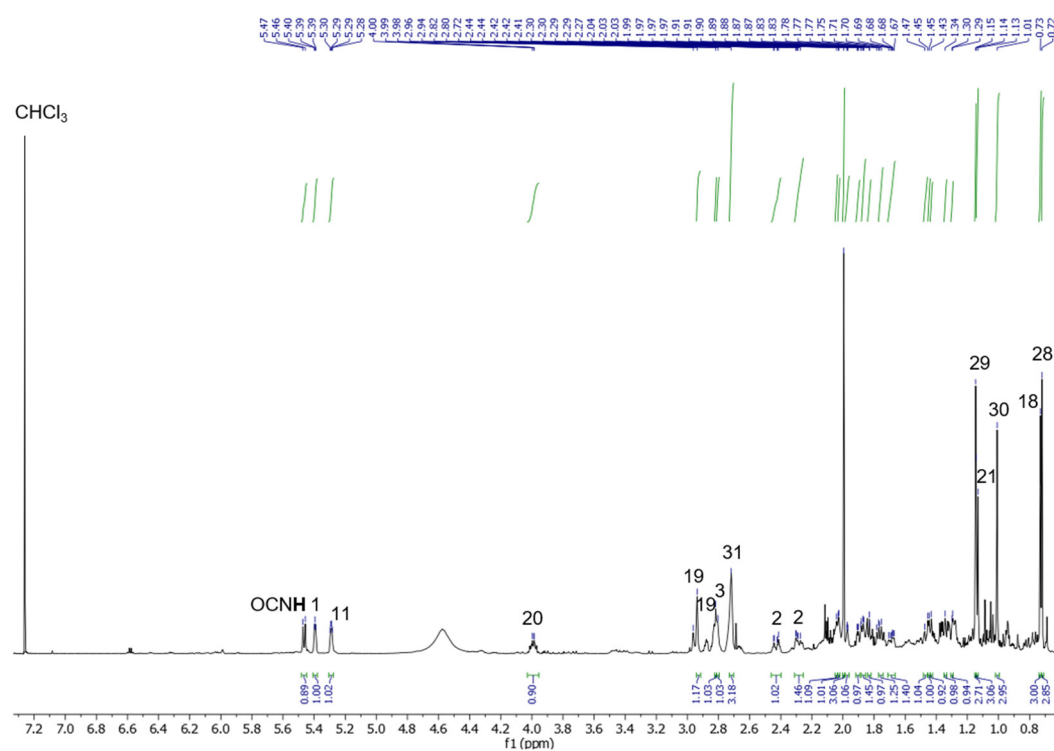


Figure S137. ¹H NMR spectrum of N₂₀-acetylbuxadine-G (24) (CDCl₃, 600 MHz). The assignment of the signals between 1.25 and 2.05 ppm can be found in the enlarged Figure S138.

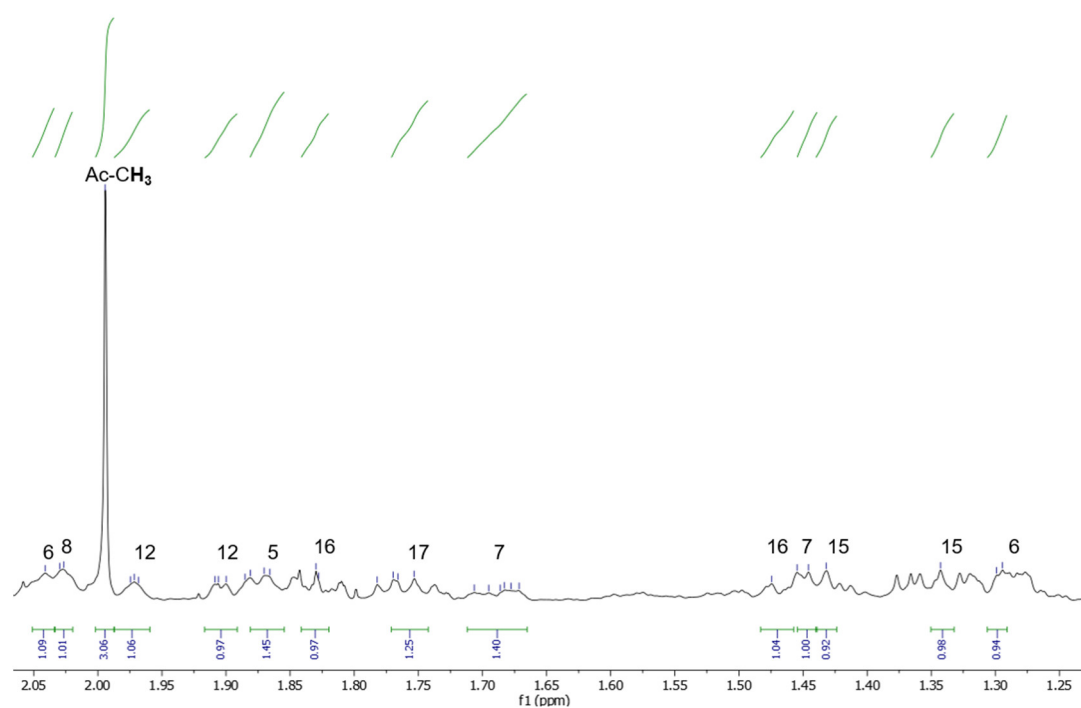


Figure S138. Detail of the ^1H NMR spectrum of N_{20} -acetylbuxadine-G (**24**) (CDCl_3 , 600 MHz).

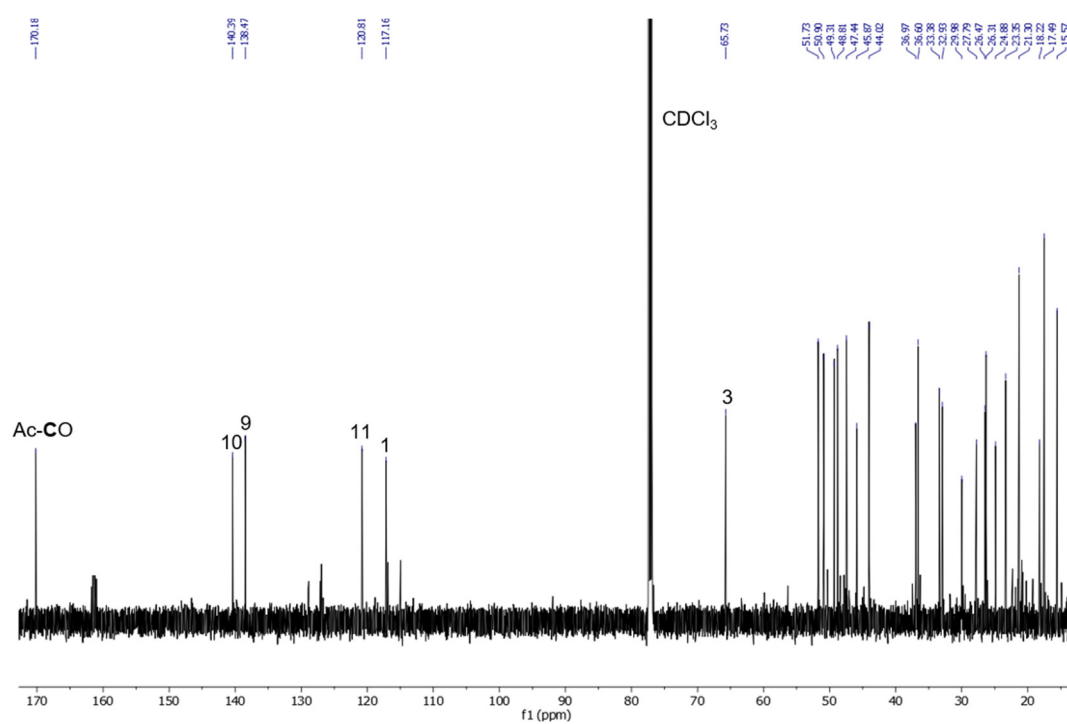


Figure S139. ^{13}C NMR spectrum of N_{20} -acetylbuxadine-G (**24**) (CDCl_3 , 150 MHz). The assignment of the signals between 15 and 52 ppm can be found in the enlarged Figure S140.

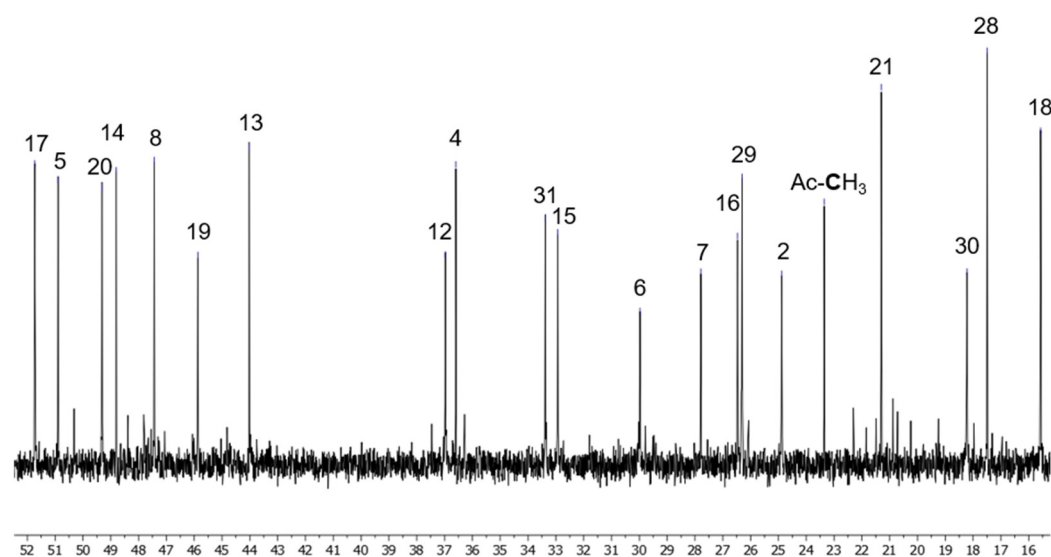


Figure S140. Detail of the ^{13}C NMR spectrum of N_{20} -acetylbuxadine-G (**24**) (CDCl_3 , 150 MHz).

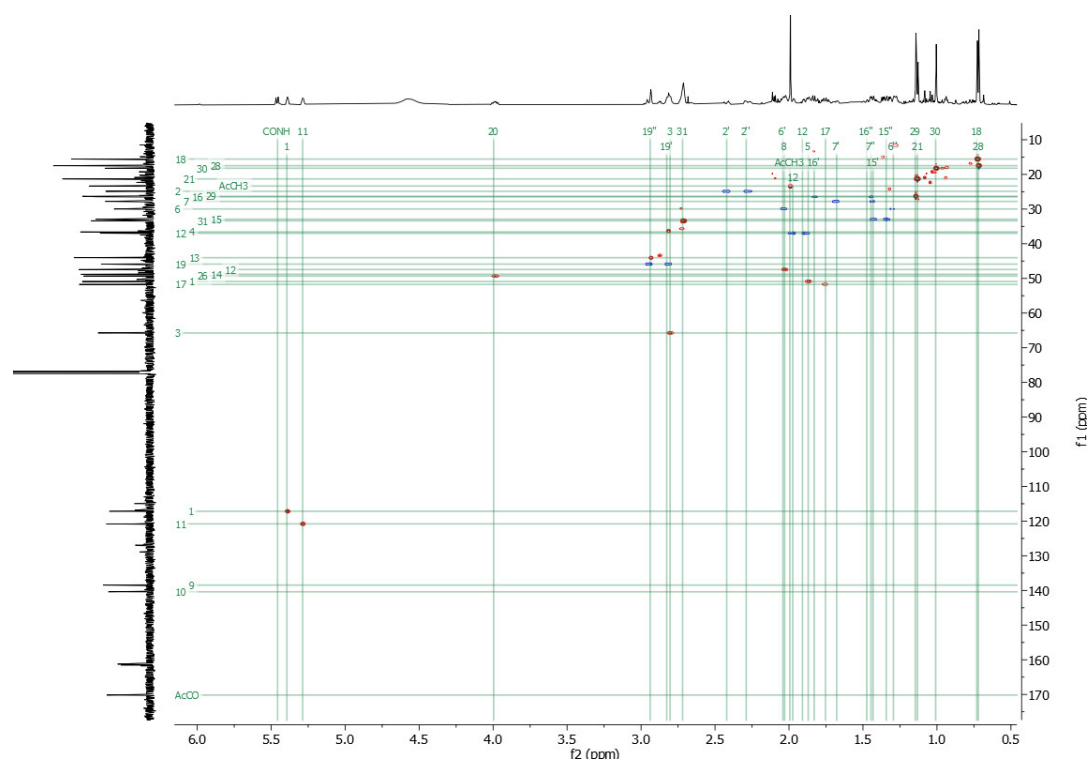


Figure S141. $^1\text{H}/^{13}\text{C}$ HSQC spectrum of N_{20} -acetylbuxadine-G (**24**) (CDCl_3 , 600/150 MHz).

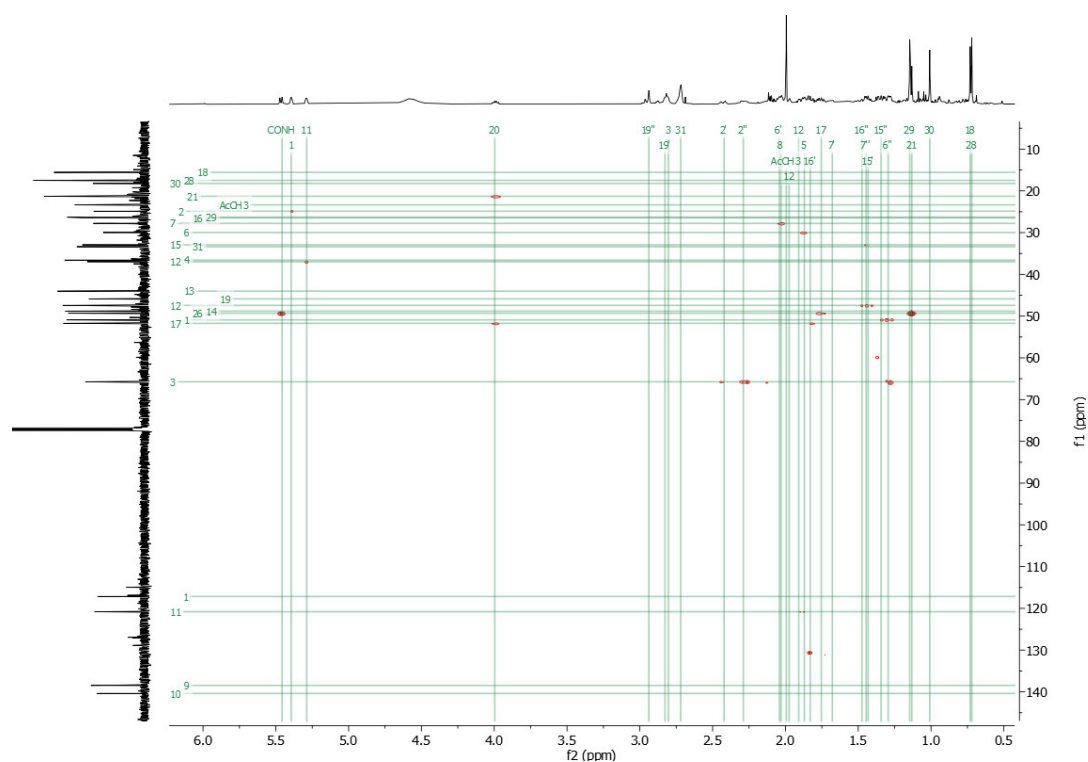


Figure S142. $^1\text{H}/^{13}\text{C}$ H2BC spectrum of N_{20} -acetylbuxadine-G (**24**) (CDCl_3 , 600/150 MHz).

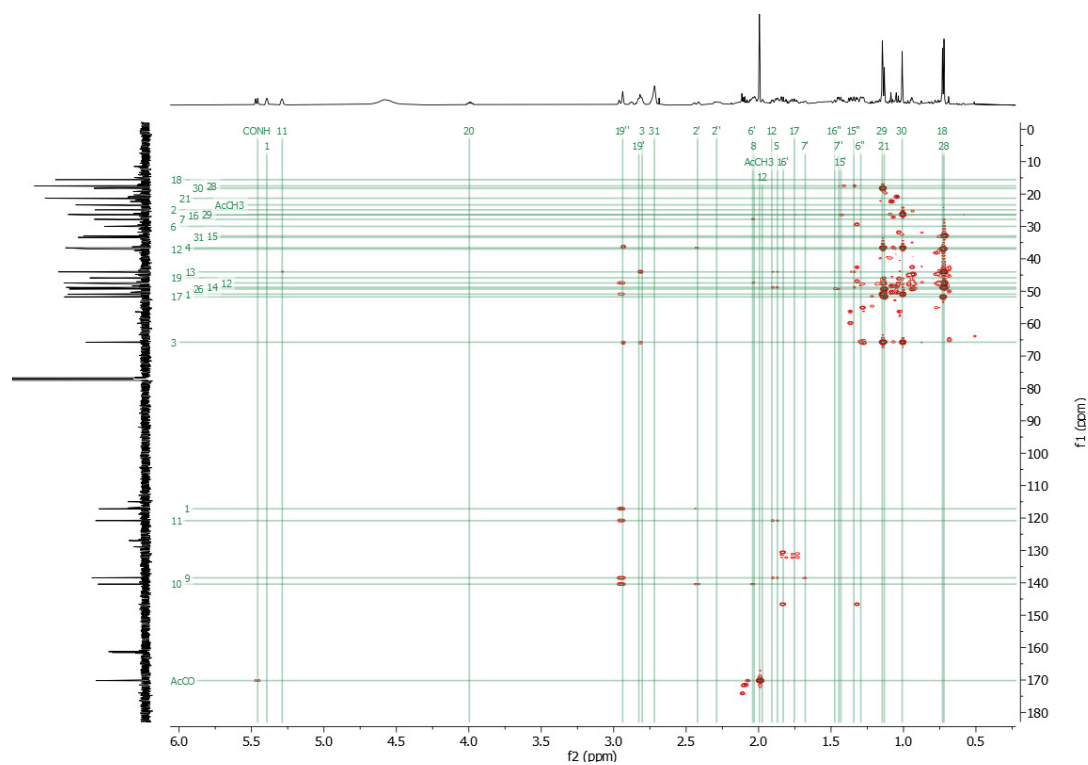
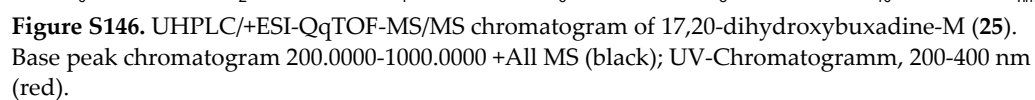
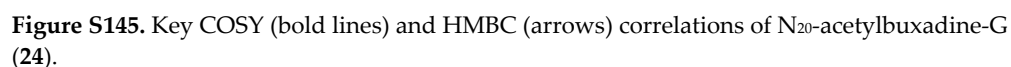
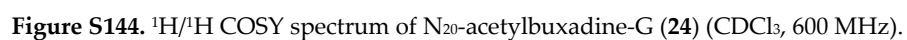


Figure S143. $^1\text{H}/^{13}\text{C}$ HMBC spectrum of N_{20} -acetylbuxadine-G (**24**) (CDCl_3 , 600/150 MHz).



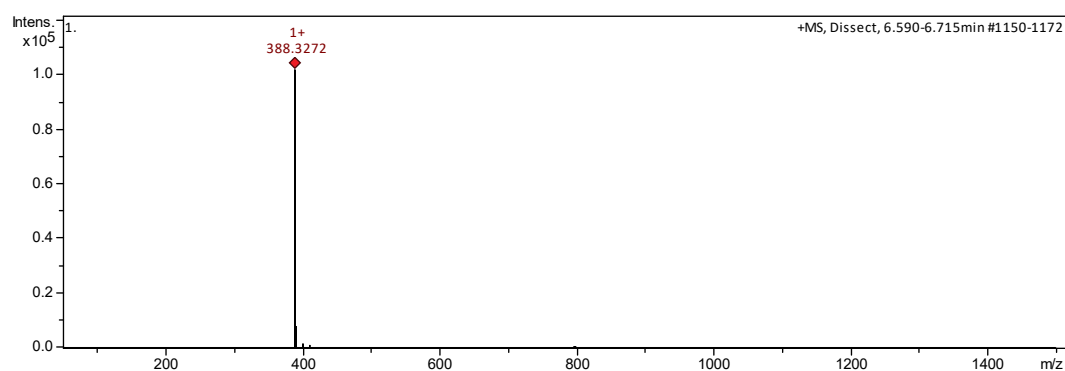


Figure S147. +ESI-QqTOF MS spectrum of 17,20-dihydroxybuxadine-M (25); m/z 388.3272 $[M+H]^+$.

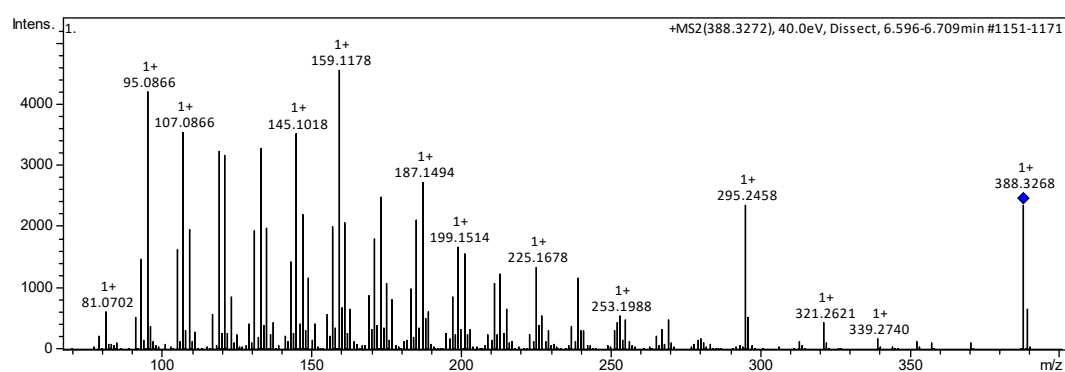


Figure S148. +ESI-QqTOF MS/MS spectrum of 17,20-dihydroxybuxadine-M (25).

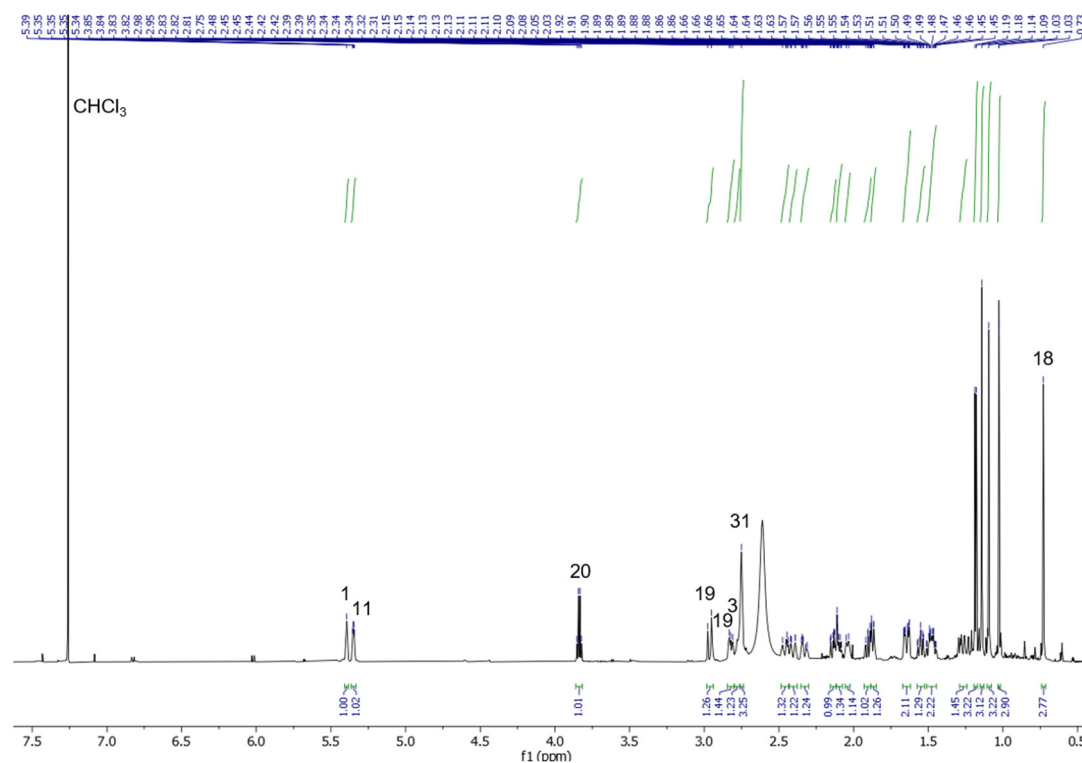


Figure S149. ^1H NMR spectrum of 17,20-dihydroxybuxadine-M (25) (CDCl_3 , 600 MHz). The assignment of the signals between 1.0 and 2.5 ppm can be found in the enlarged Figure S150.

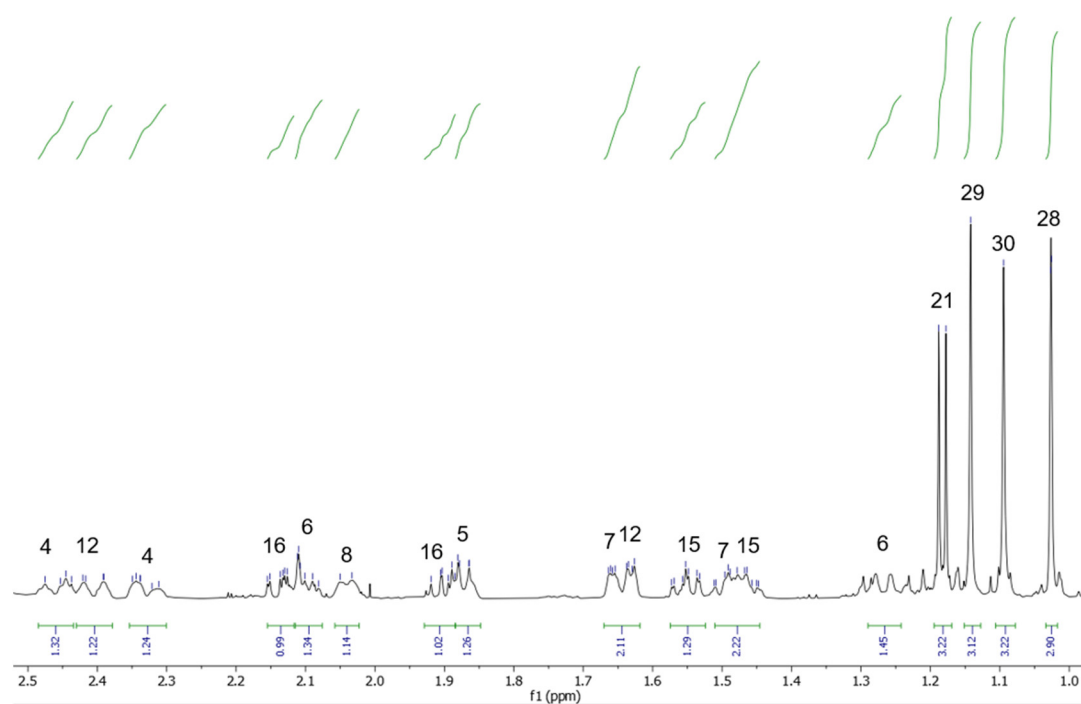


Figure S150. Detail of the ^1H NMR spectrum of 17,20-dihydroxybuxadine-M (**25**) (CDCl_3 , 600 MHz).

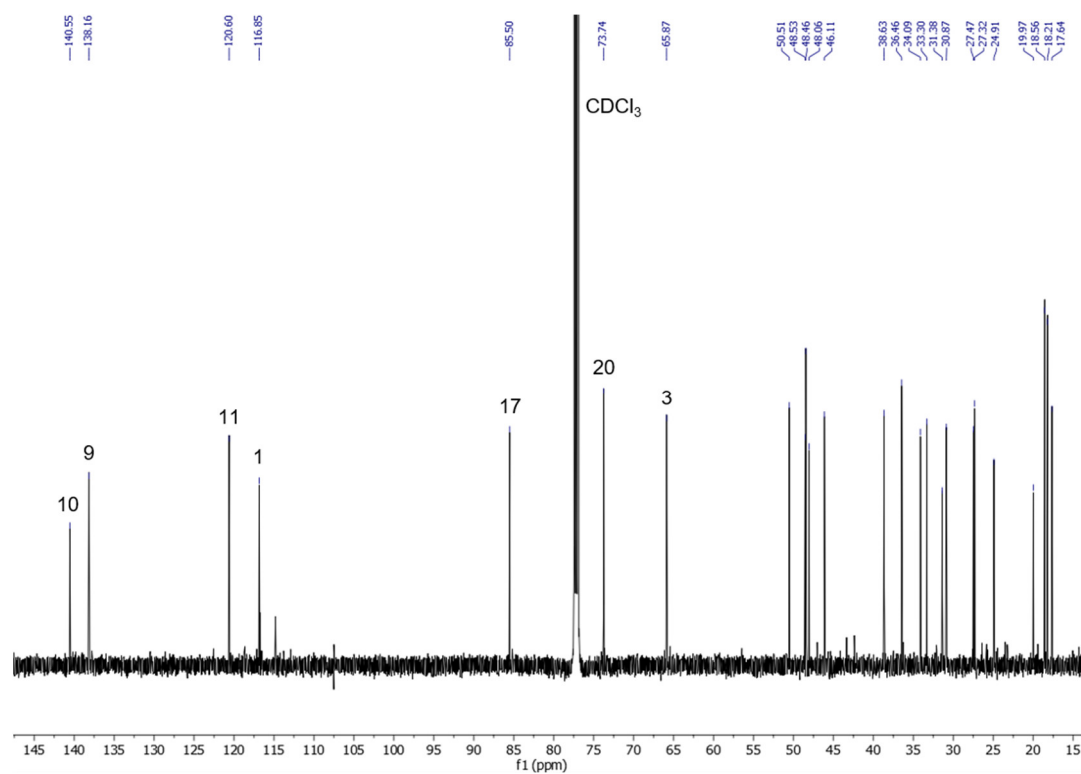


Figure S151. ^{13}C NMR spectrum of 17,20-dihydroxybuxadine-M (**25**) (CDCl_3 , 150 MHz). The assignment of the signals between 17 and 51 ppm can be found in the enlarged Figure S152.

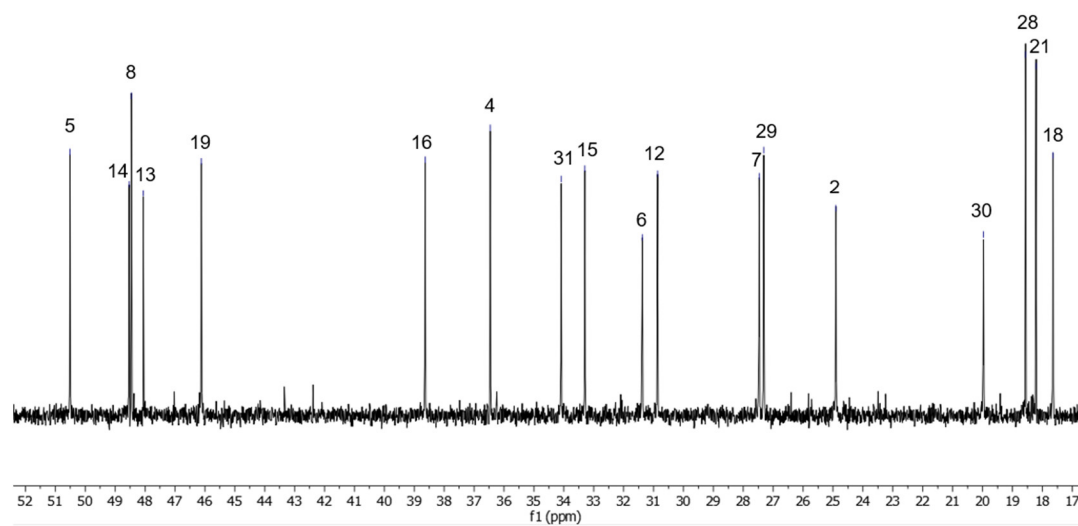


Figure S152. Detail of the ¹³C NMR spectrum of 17,20-dihydroxybuxadine-M (25) (CDCl₃, 150 MHz).

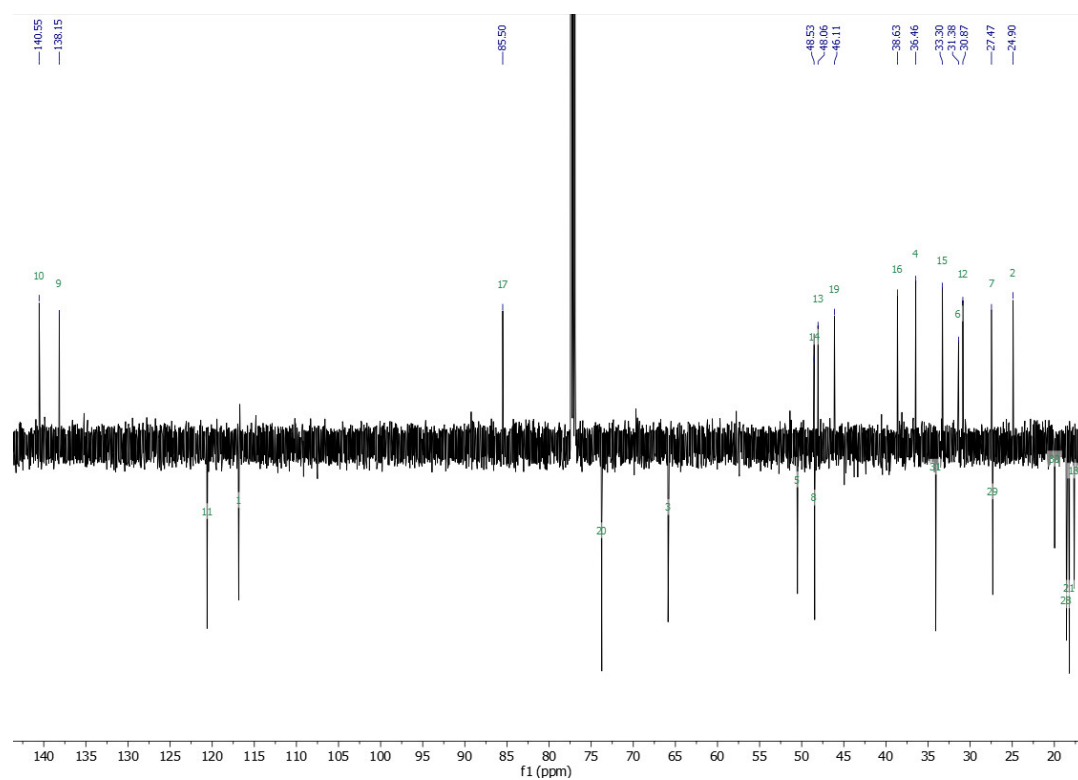


Figure S153. ¹³C APT spectrum of 17,20-dihydroxybuxadine-M (25) (CDCl₃, 150 MHz).

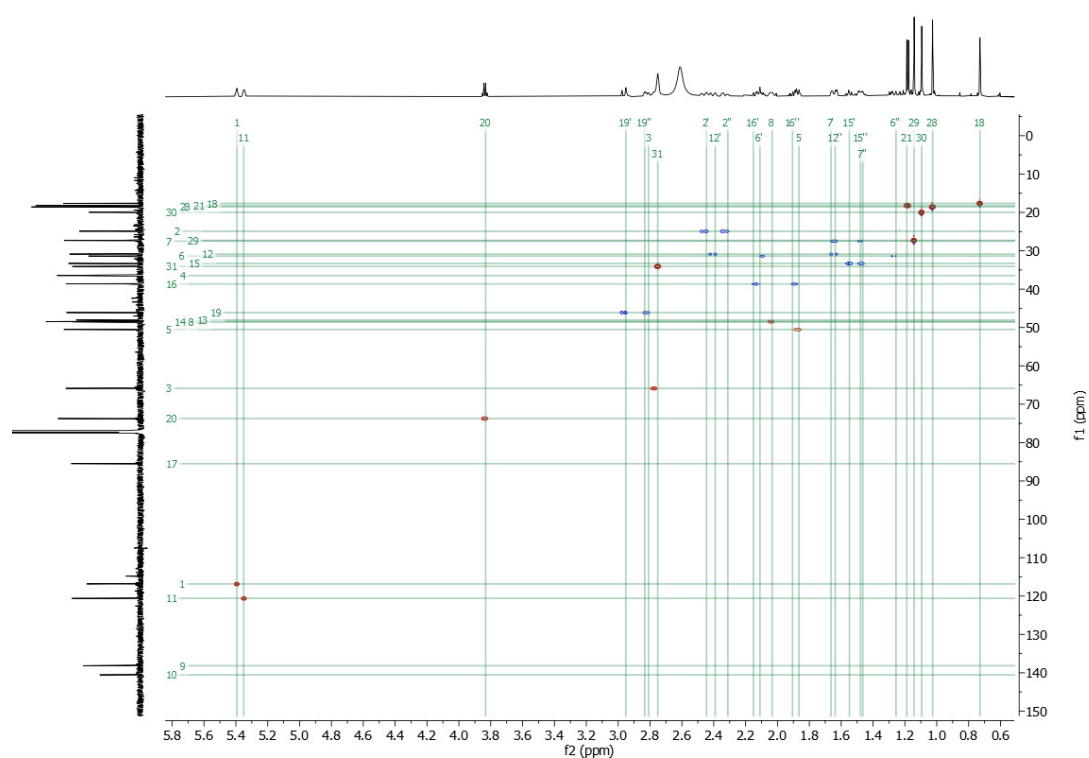


Figure S154. $^1\text{H}/^{13}\text{C}$ HSQC spectrum of 17,20-dihydroxybuxadine-M (25) (CDCl_3 , 600/150 MHz).

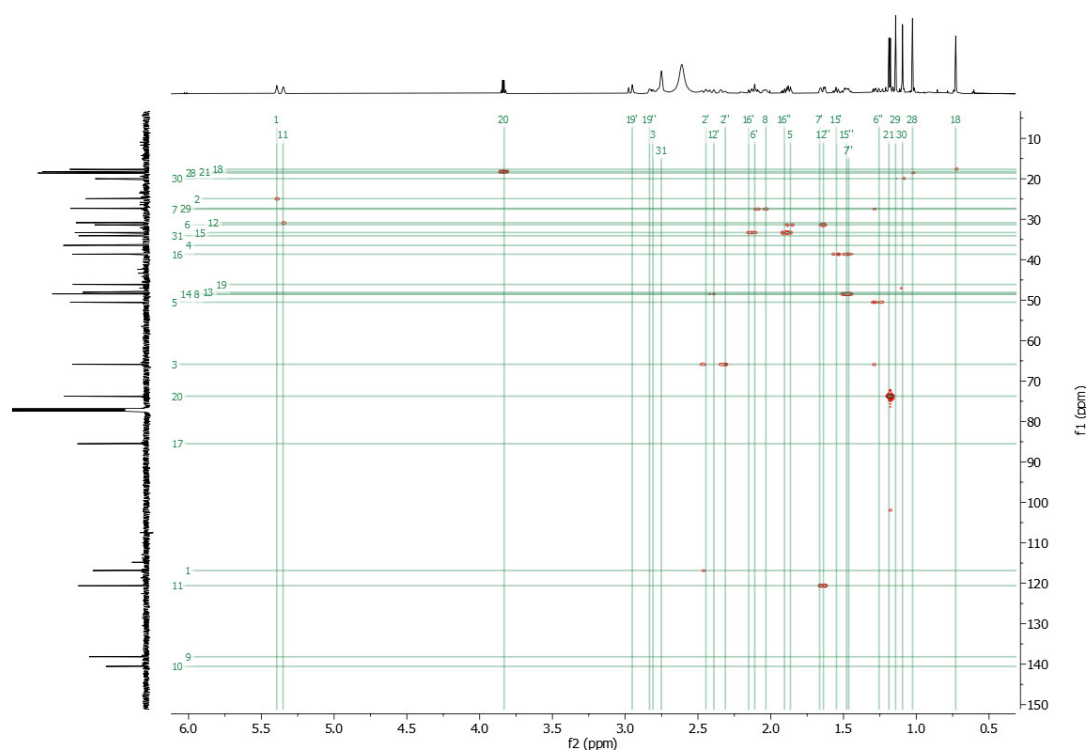


Figure S155. $^1\text{H}/^{13}\text{C}$ H2BC spectrum of 17,20-dihydroxybuxadine-M (25) (CDCl_3 , 600/150 MHz).

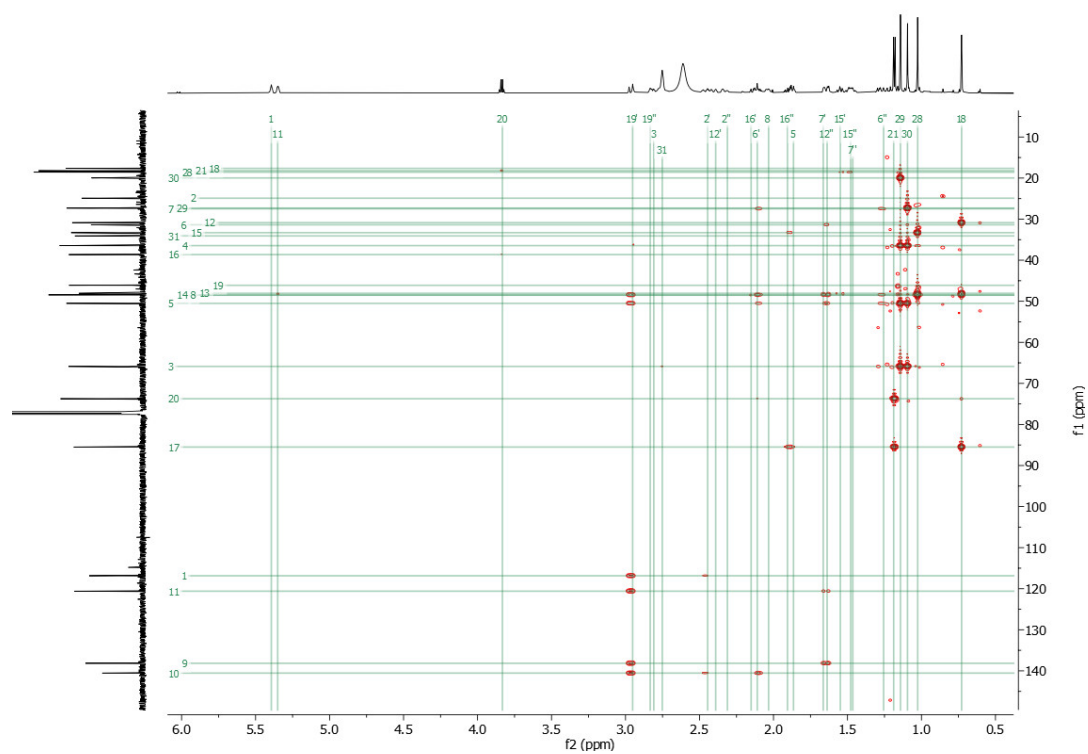


Figure S156. $^1\text{H}/^{13}\text{C}$ HMBC spectrum of 17,20-dihydroxybuxadine-M (25) (CDCl_3 , 600/150 MHz).

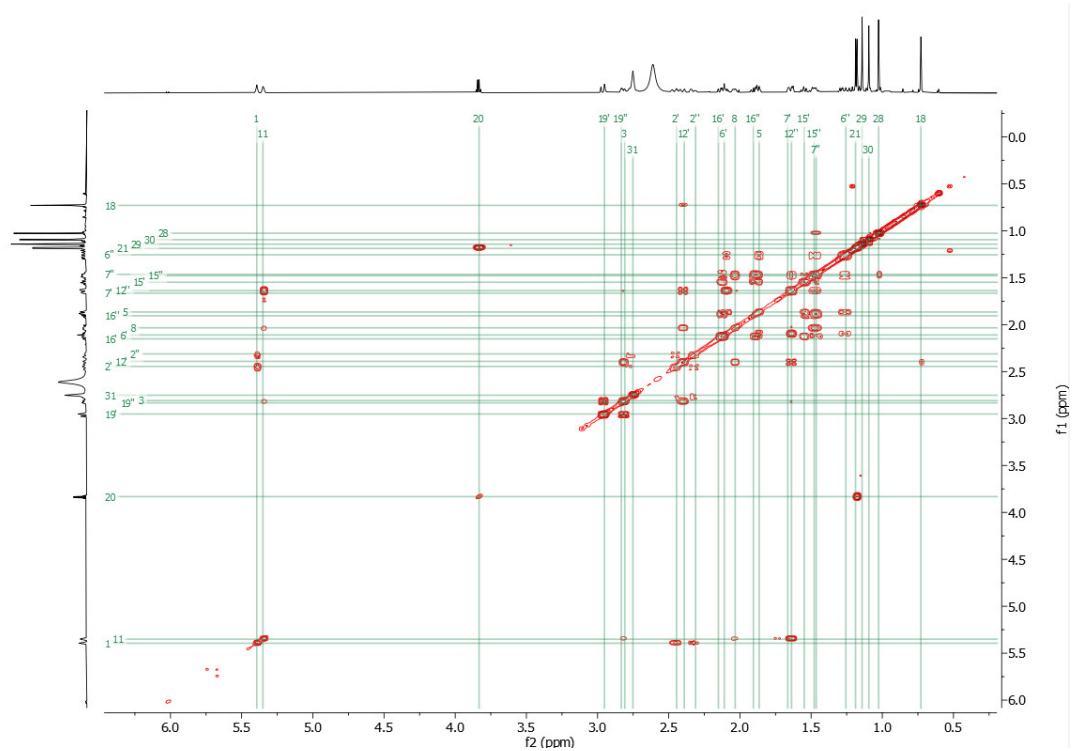


Figure S157. $^1\text{H}/^1\text{H}$ COSY spectrum of 17,20-dihydroxybuxadine-M (25) (CDCl_3 , 600 MHz).

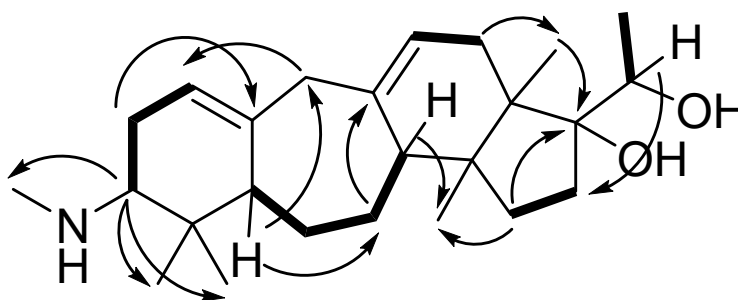


Figure S158. Key COSY (bold lines) and HMBC (arrows) correlations of 17,20-dihydroxybuxadine-M (25).