

Electronic Supplementary Information (ESI)

Ancistrobreveines A-D and Related Dehydrogenated Naphthylisoquinoline Alkaloids with Antiproliferative Activities against Leukemia Cells, from the West African Liana

Ancistrocladus abbreviatus

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¹ Deceased on January 14, 2014.

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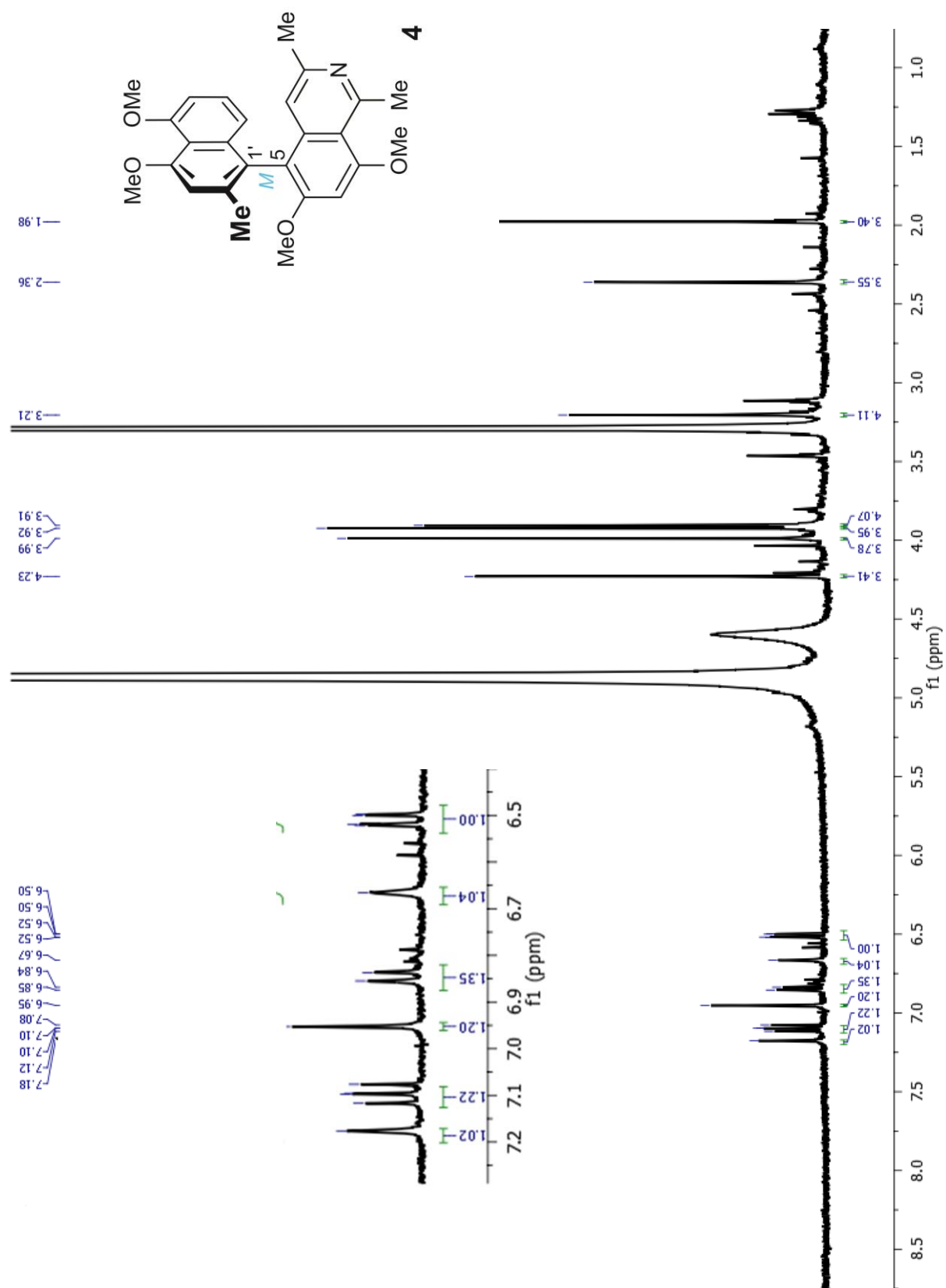


Figure S1. ¹H NMR spectrum of 6-O-methylhamateine (4).

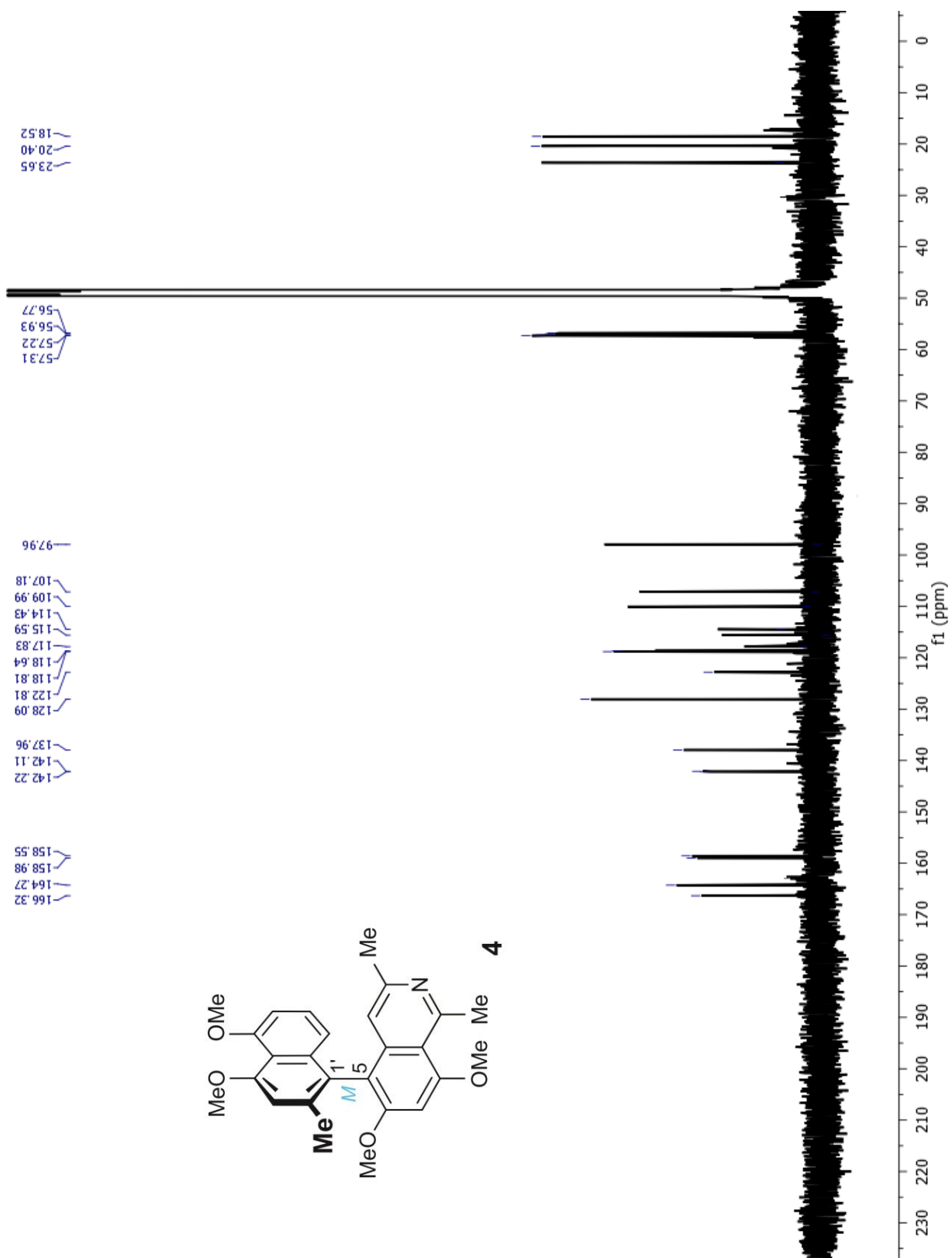


Figure S2. ¹³C NMR spectrum of 6-O-methylhamateine (4).

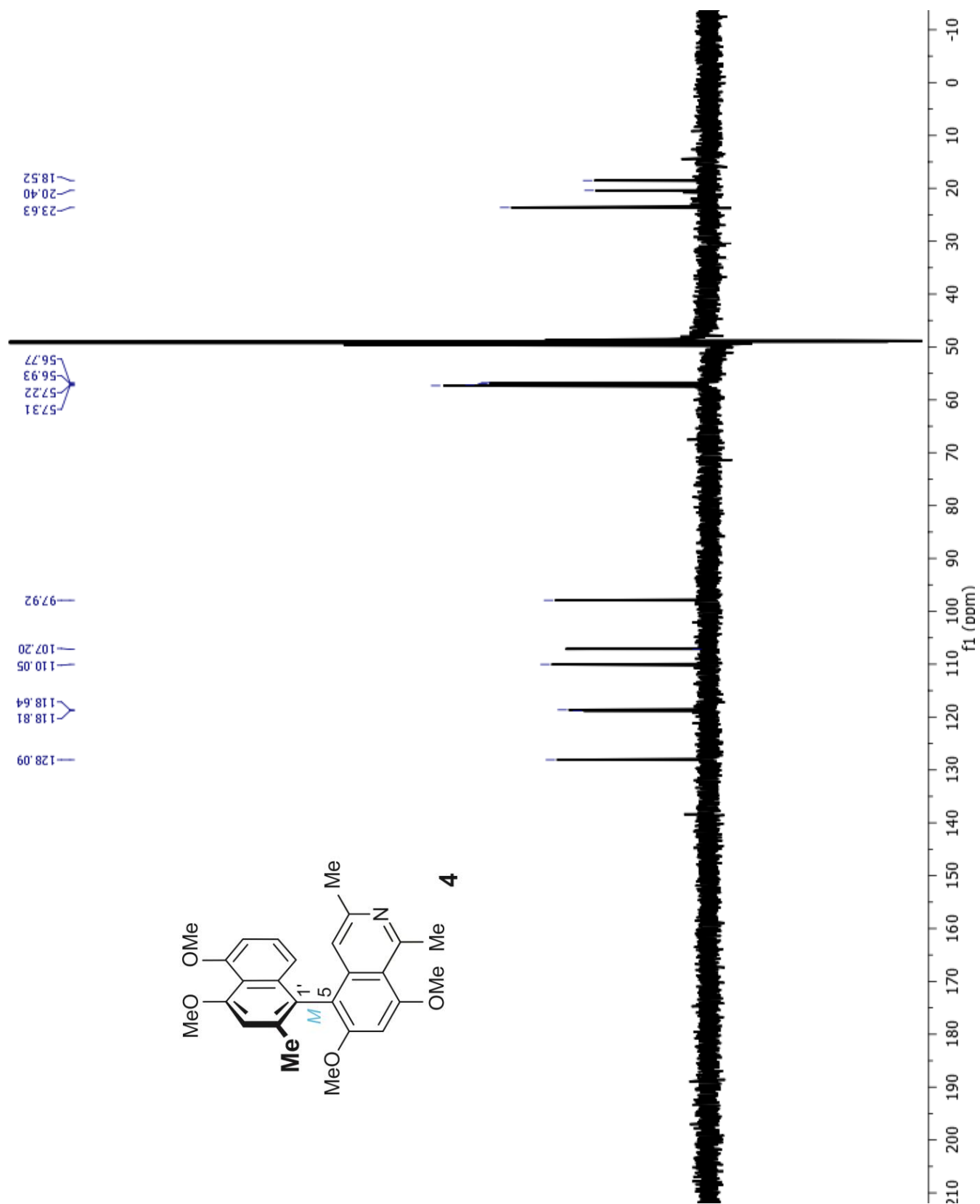


Figure S3. ^{13}C DEPT spectrum of 6-O-methylhamateine (4).

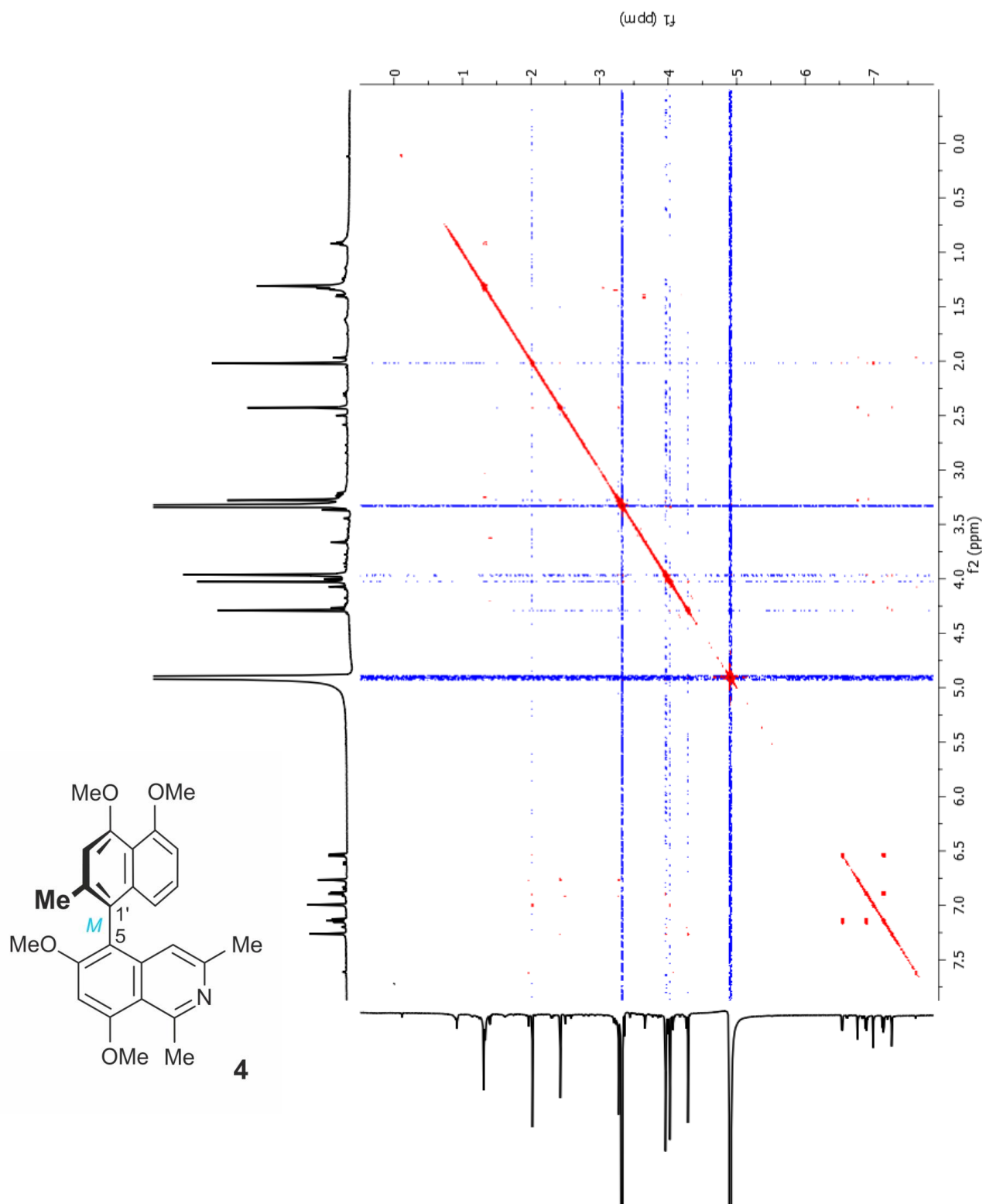


Figure S4. COSY spectrum of 6-O-methylhamateine (**4**).

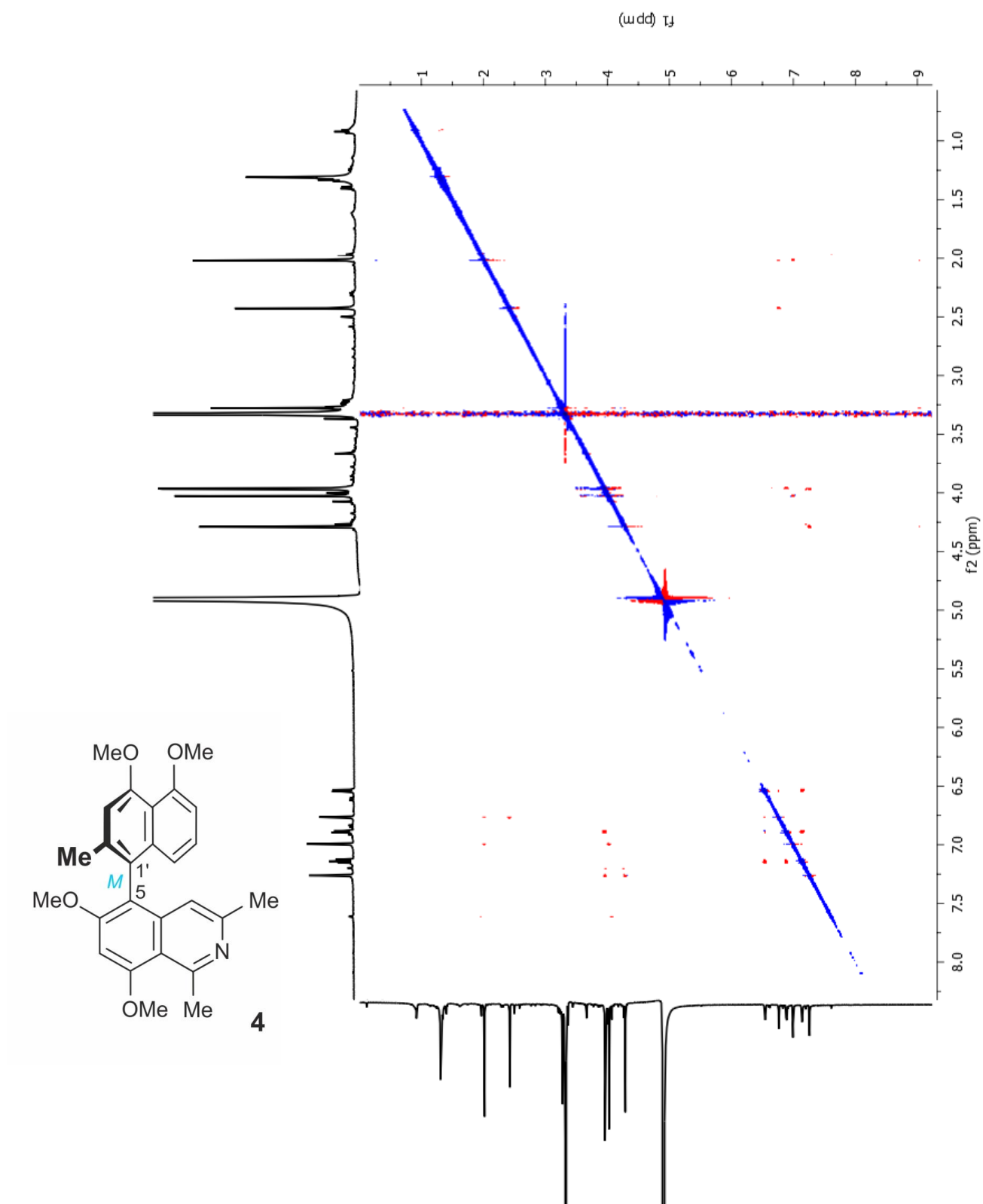


Figure S5. ^1H - ^1H NOESY spectrum of 6-O-methylhamateine (4).

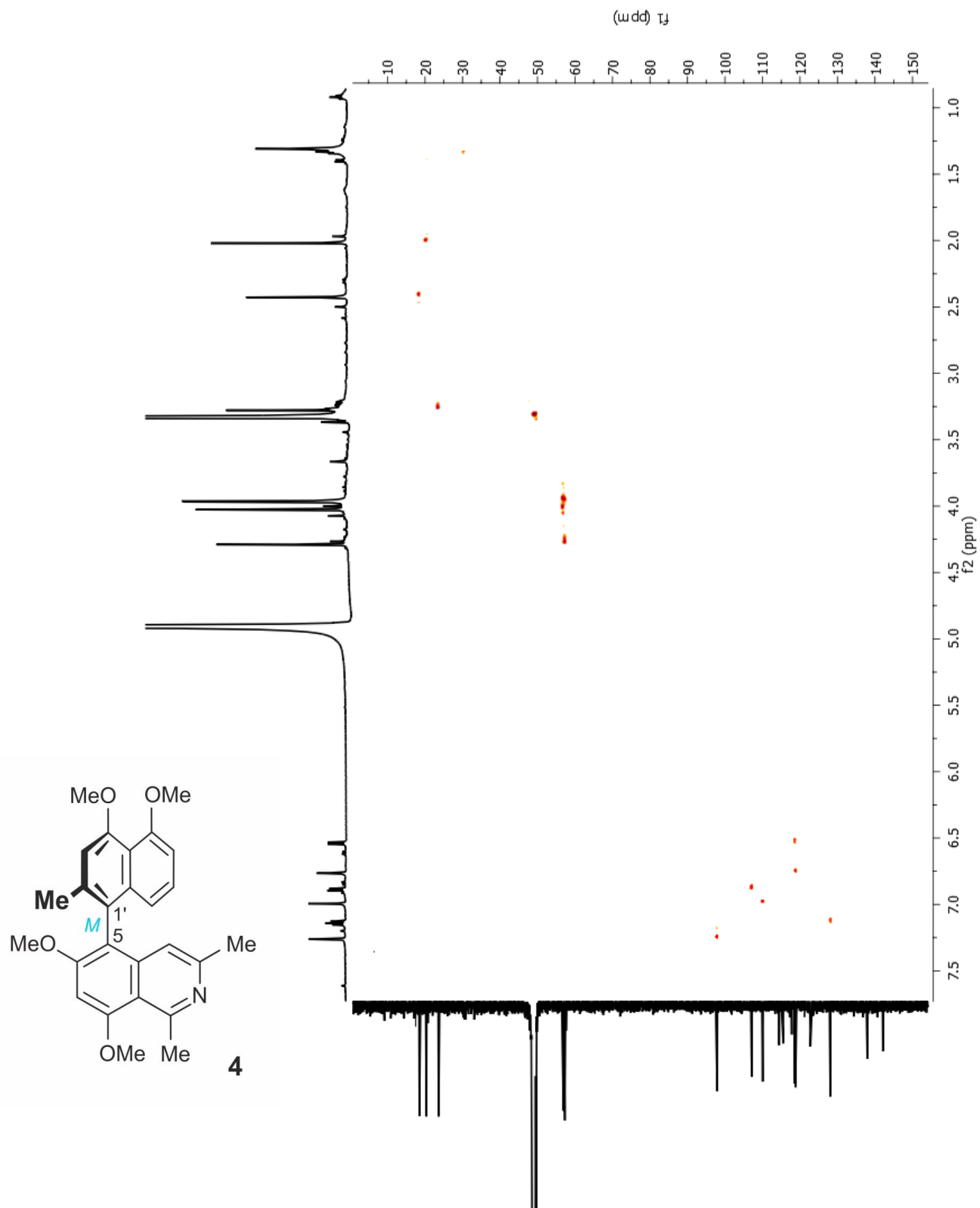


Figure S6. HSQC spectrum of 6-O-methylhamateine (4).

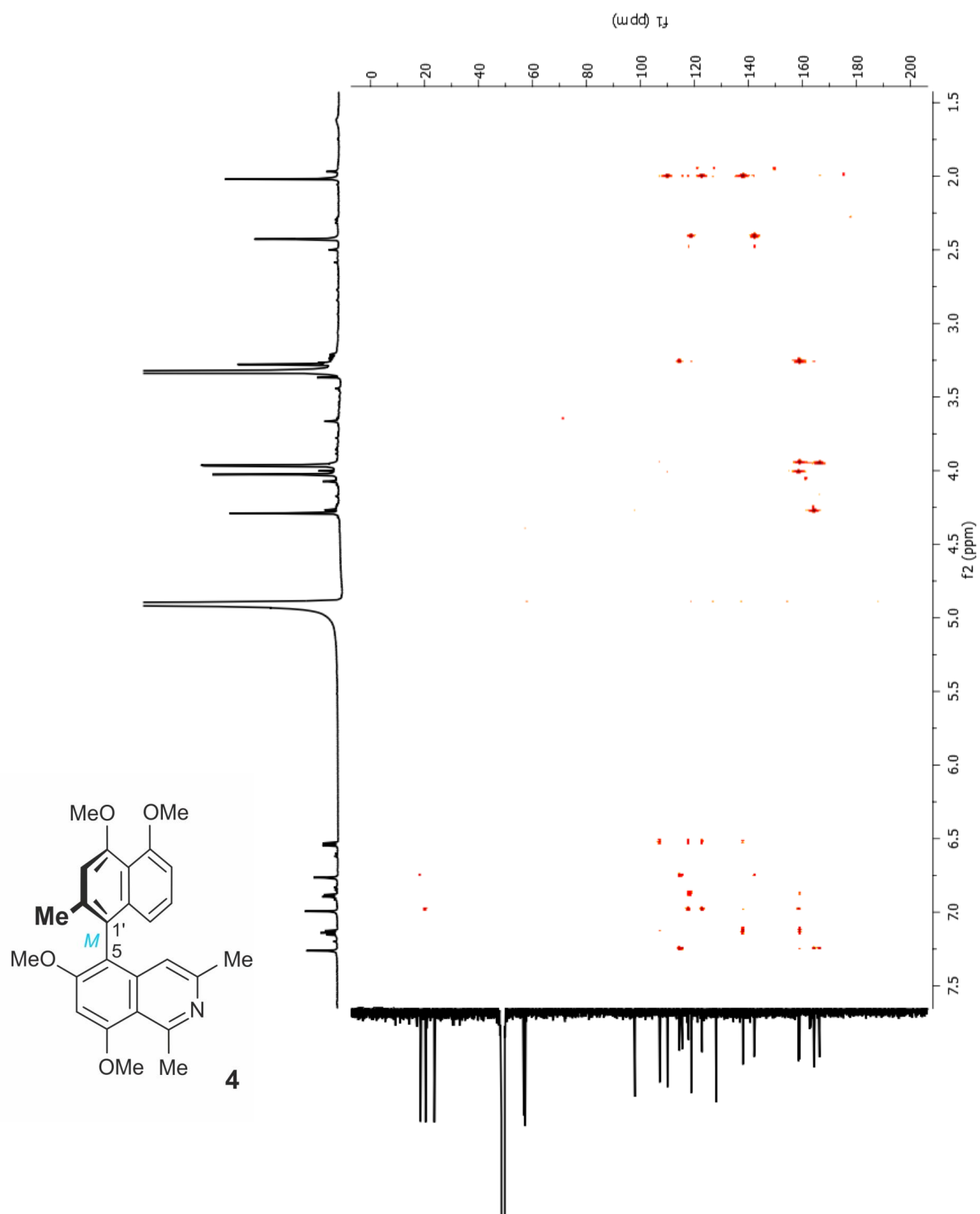


Figure S7. HMBC spectrum of ancistrolikokine A₂ (13).

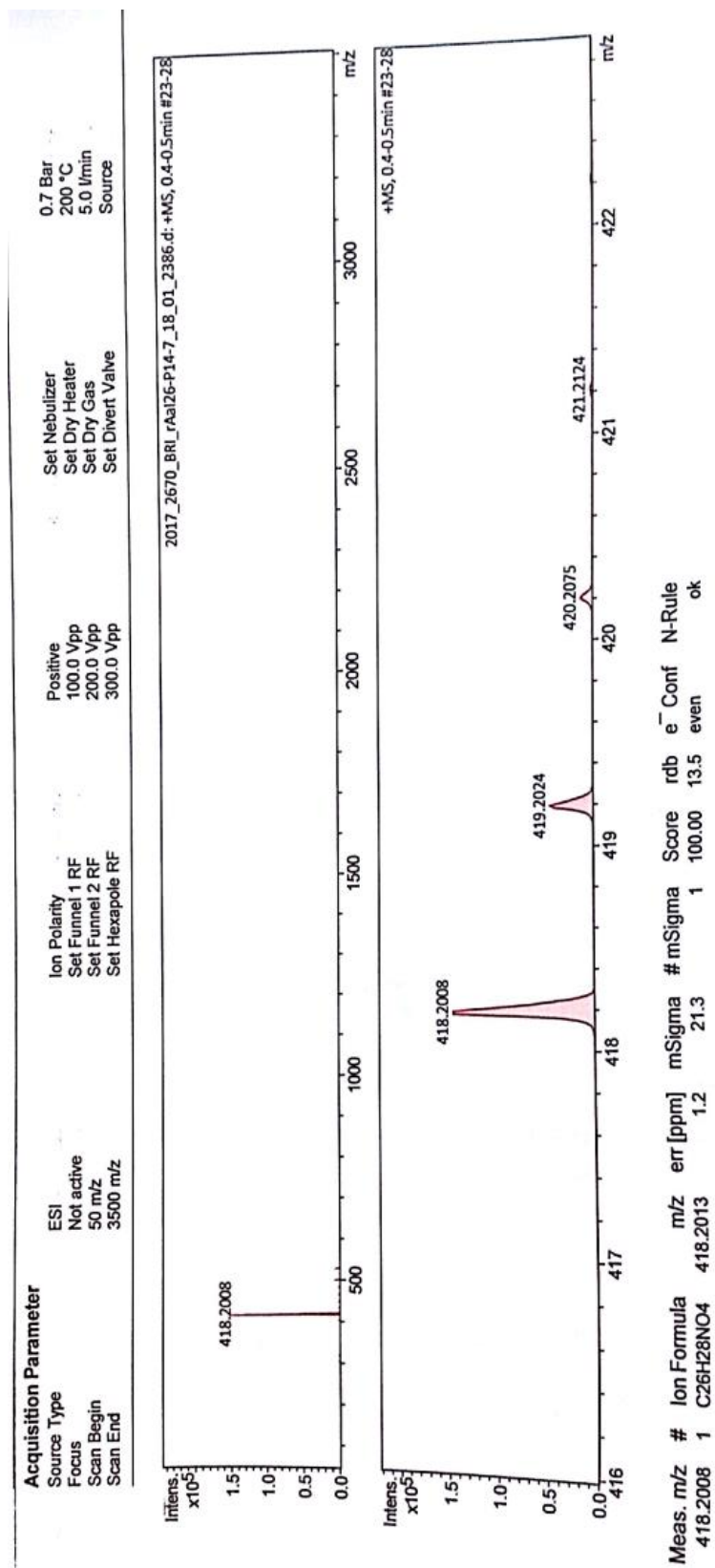
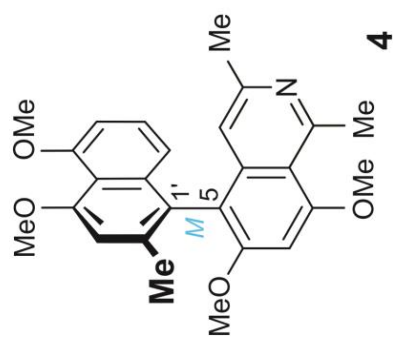
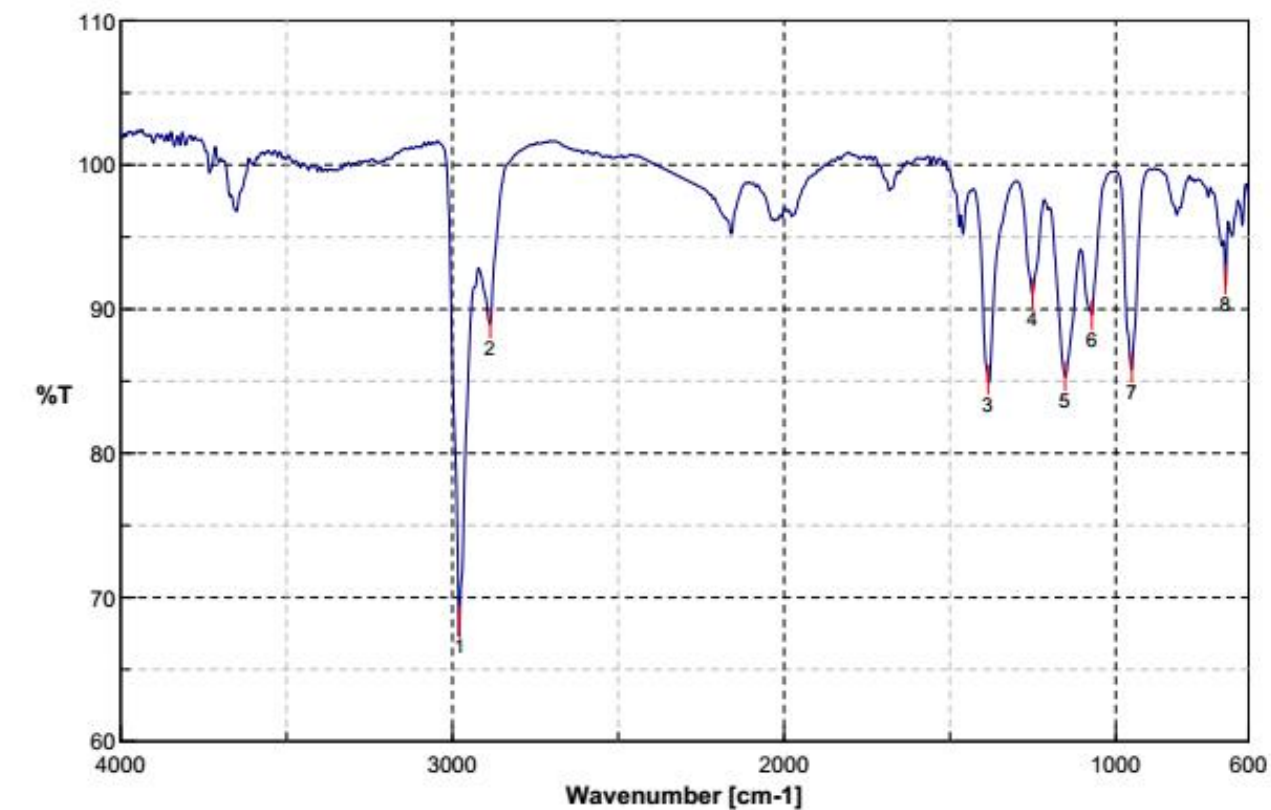
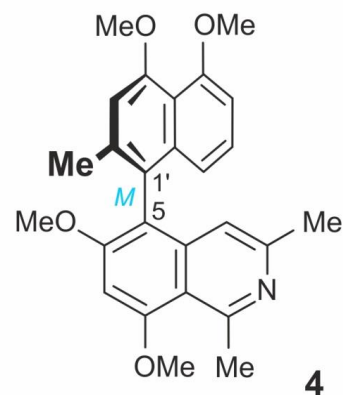


Figure S8. HRESIMS spectrum of 6-O-methylhamateine (**4**).



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Figure S9. IR spectrum 6-O-methylhamateine (4).

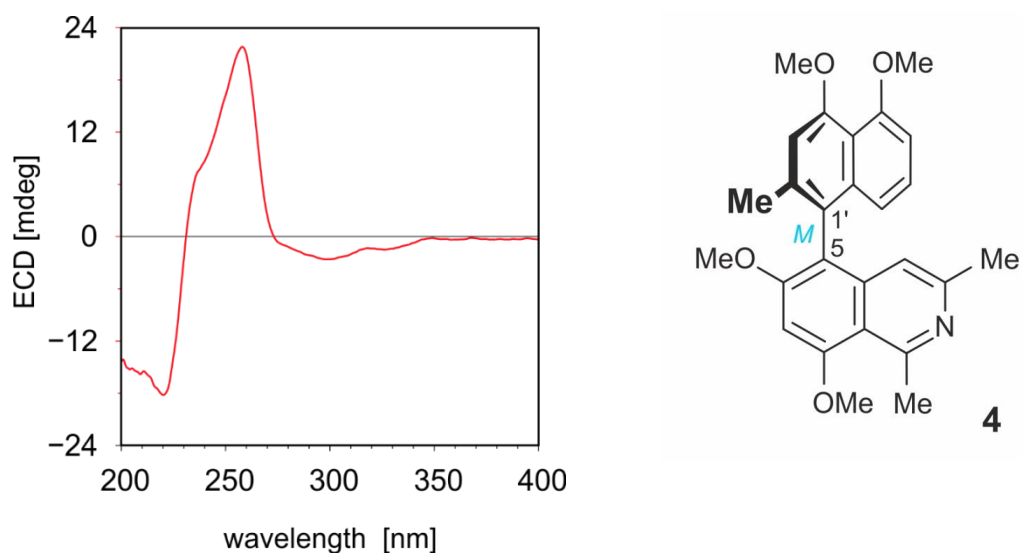


Figure S10a. ECD spectrum of 6-O-methylhamateine (**4**).

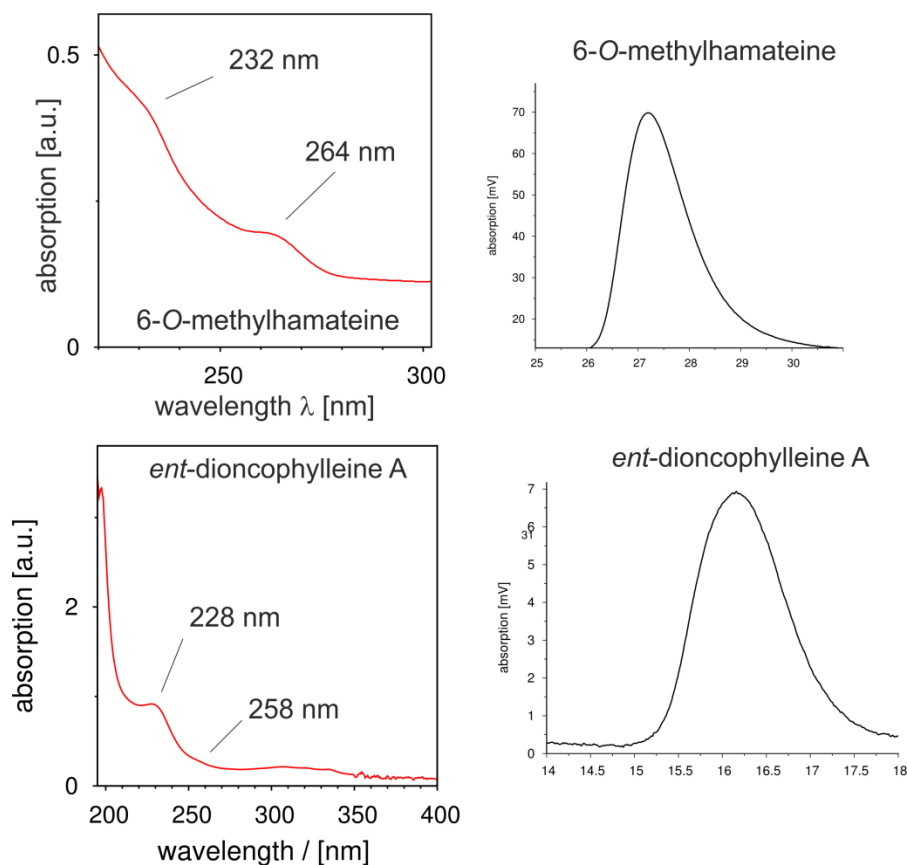


Figure S10b. UV spectrum of 6-O-methylhamateine (**4**) (top left) and *ent*-dioncophylleine A (*ent*-**10**) (left below) and HPLC analysis of 6-O-methylhamateine (**4**) (top right) and *ent*-dioncophylleine A (*ent*-**10**) (right below) on a chiral phase (Lux Cellulose-1) evidencing that **4** and *ent*-**10** were present in the plant in an enantiopure form (chromatography on a Lux Cellulose-1 column (250 × 4.6 mm, 5 μm, Phenomenex) with H₂O (0.05% trifluoroacetic acid) and MeCN (0.05% trifluoroacetic acid) as the eluents).

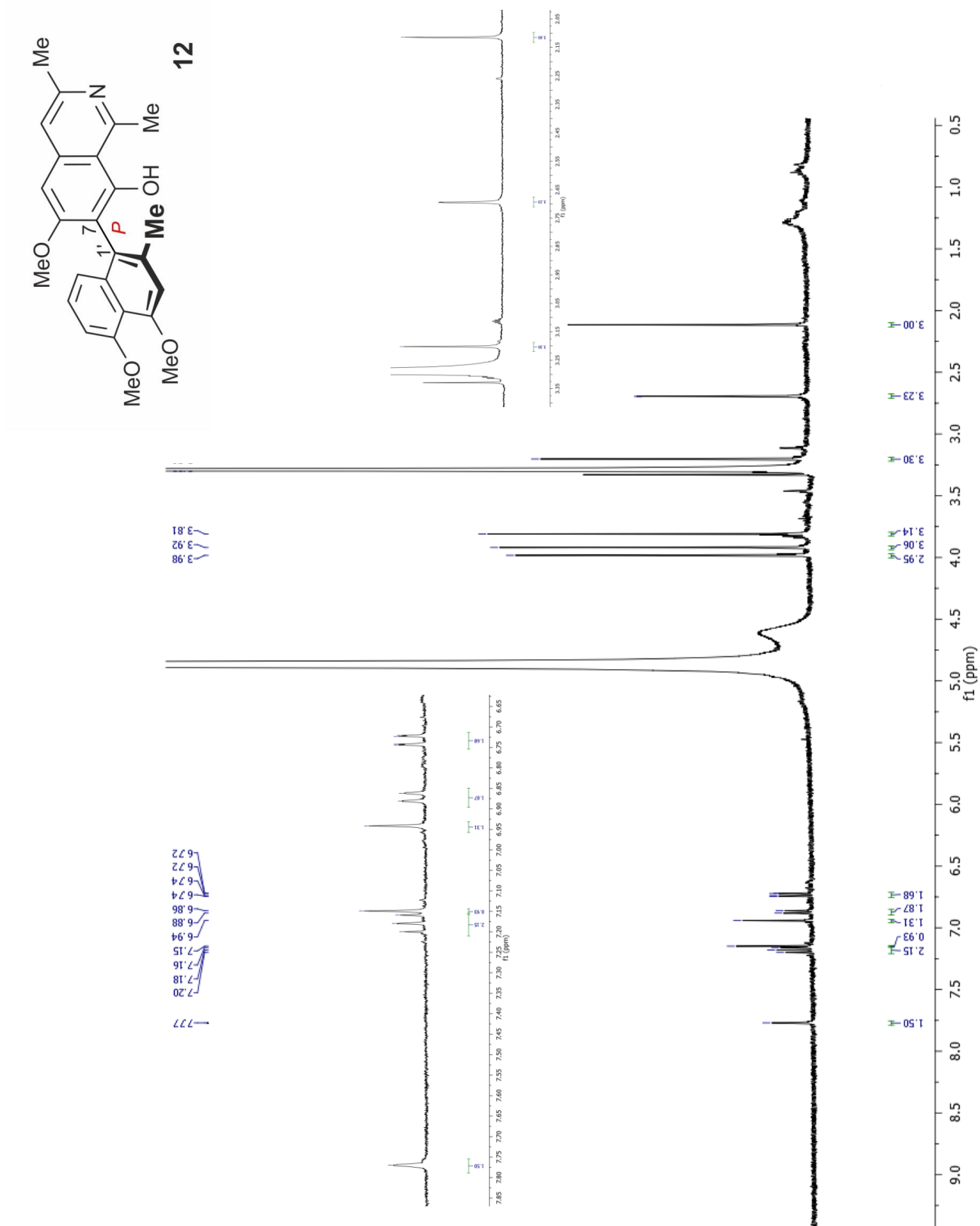


Figure S11. ¹H NMR spectrum of ancistrobreveine A (12).

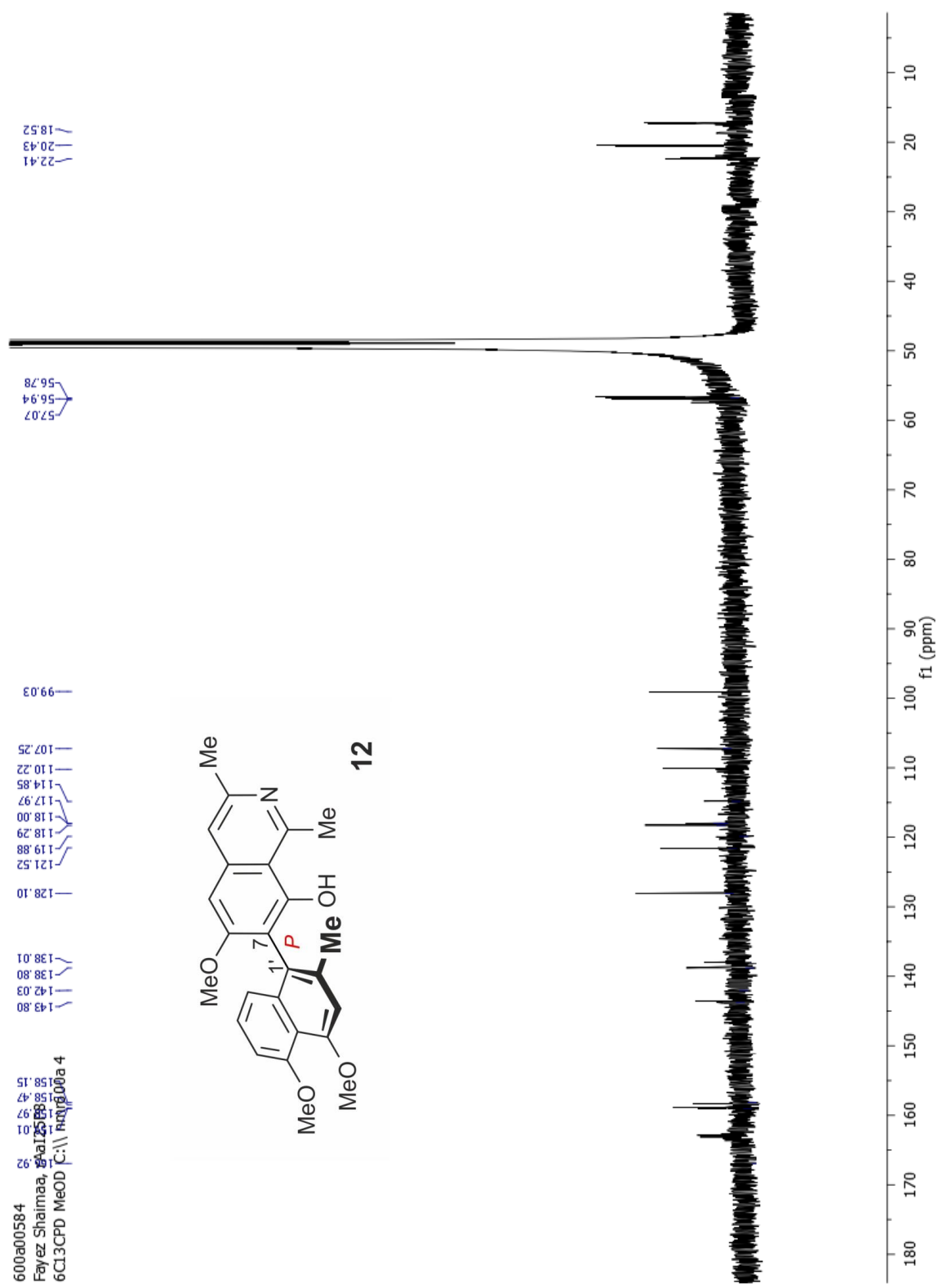


Figure S12. ¹³C NMR spectrum of ancistrobreveine A (**12**).

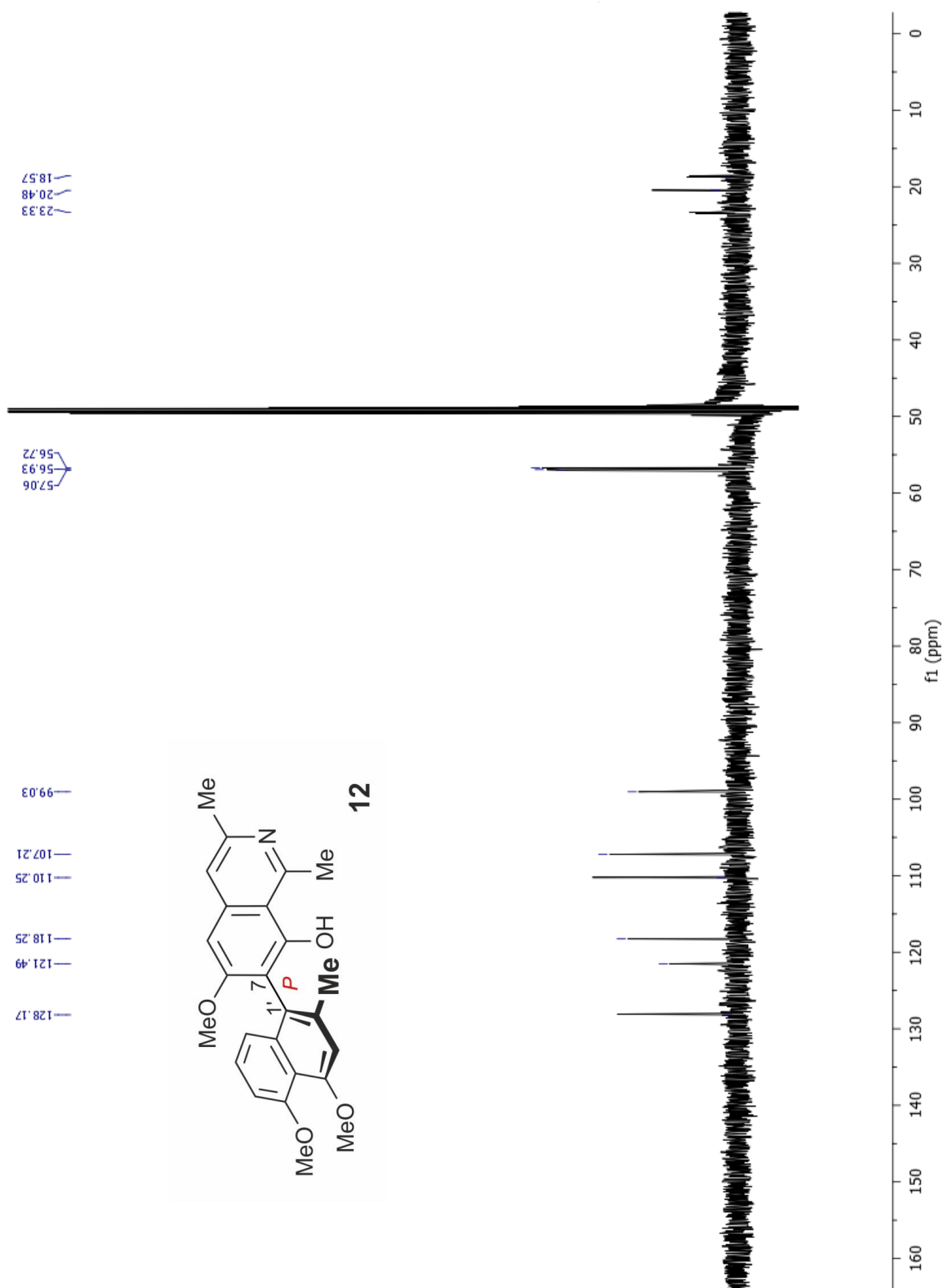


Figure S13. ^{13}C DEPT spectrum of ancistrobreveine A (12).

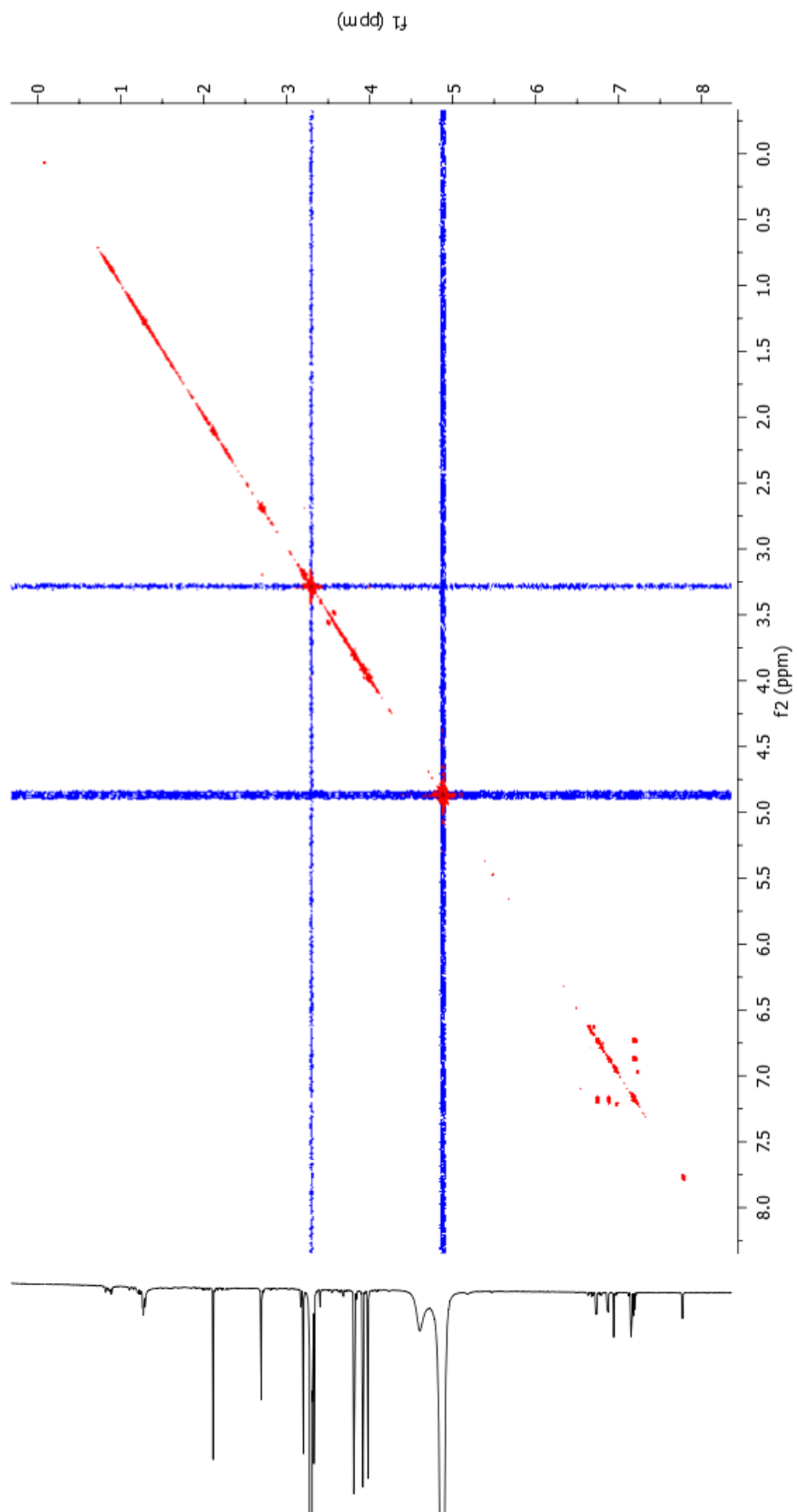
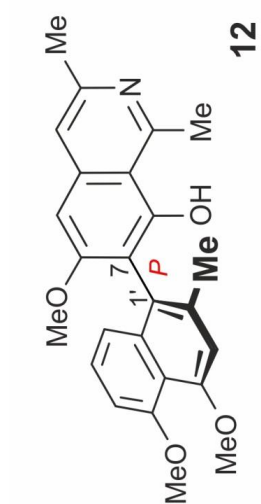


Figure S14. COSY spectrum of ancistrobreveine A (12).

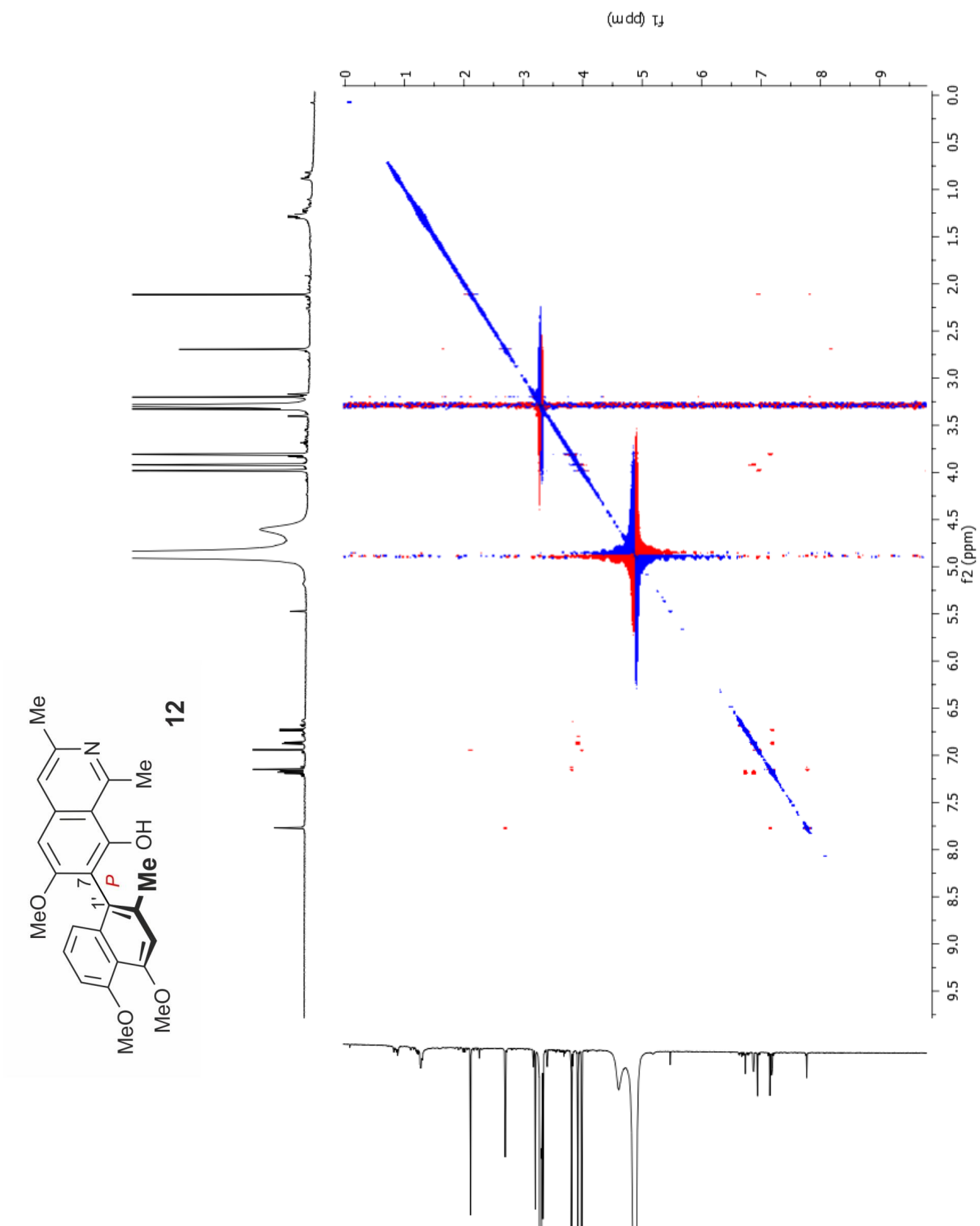


Figure S15. ^1H - ^1H NOESY spectrum of ancistrobreveine A (12).

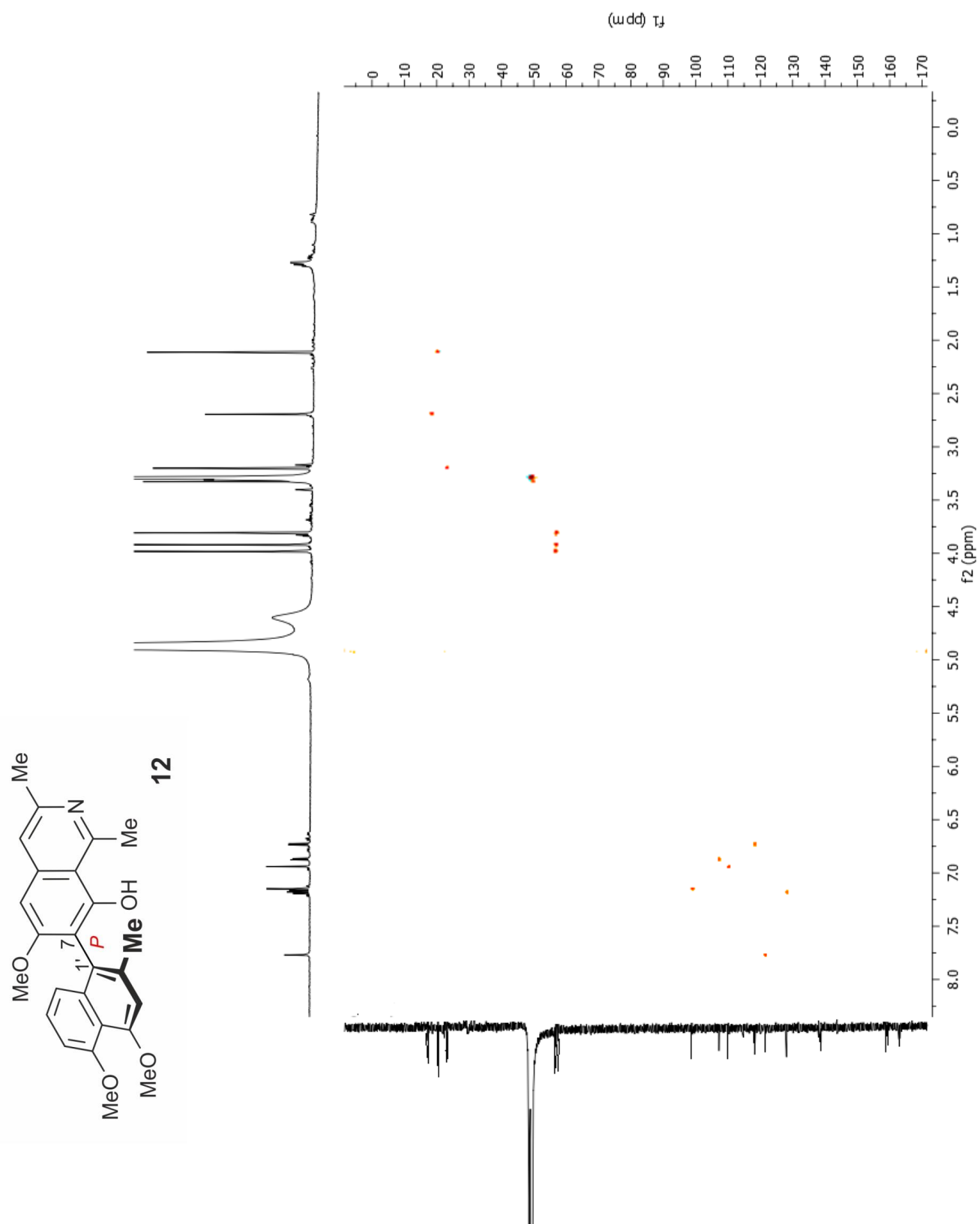


Figure S16. HSQC spectrum of ancistrobreveine A (12).

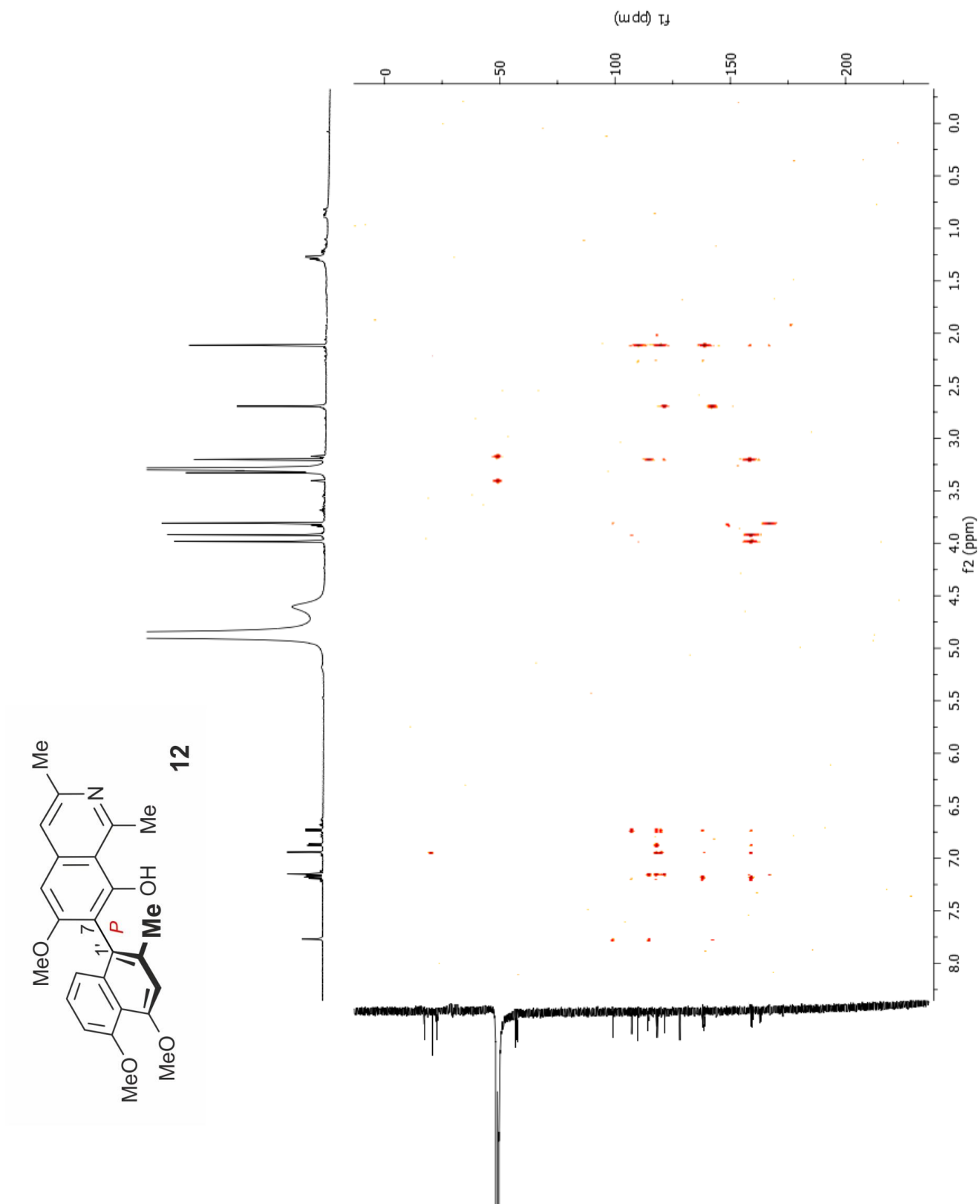


Figure S17. HMBC spectrum of ancistrobreveine A (12).

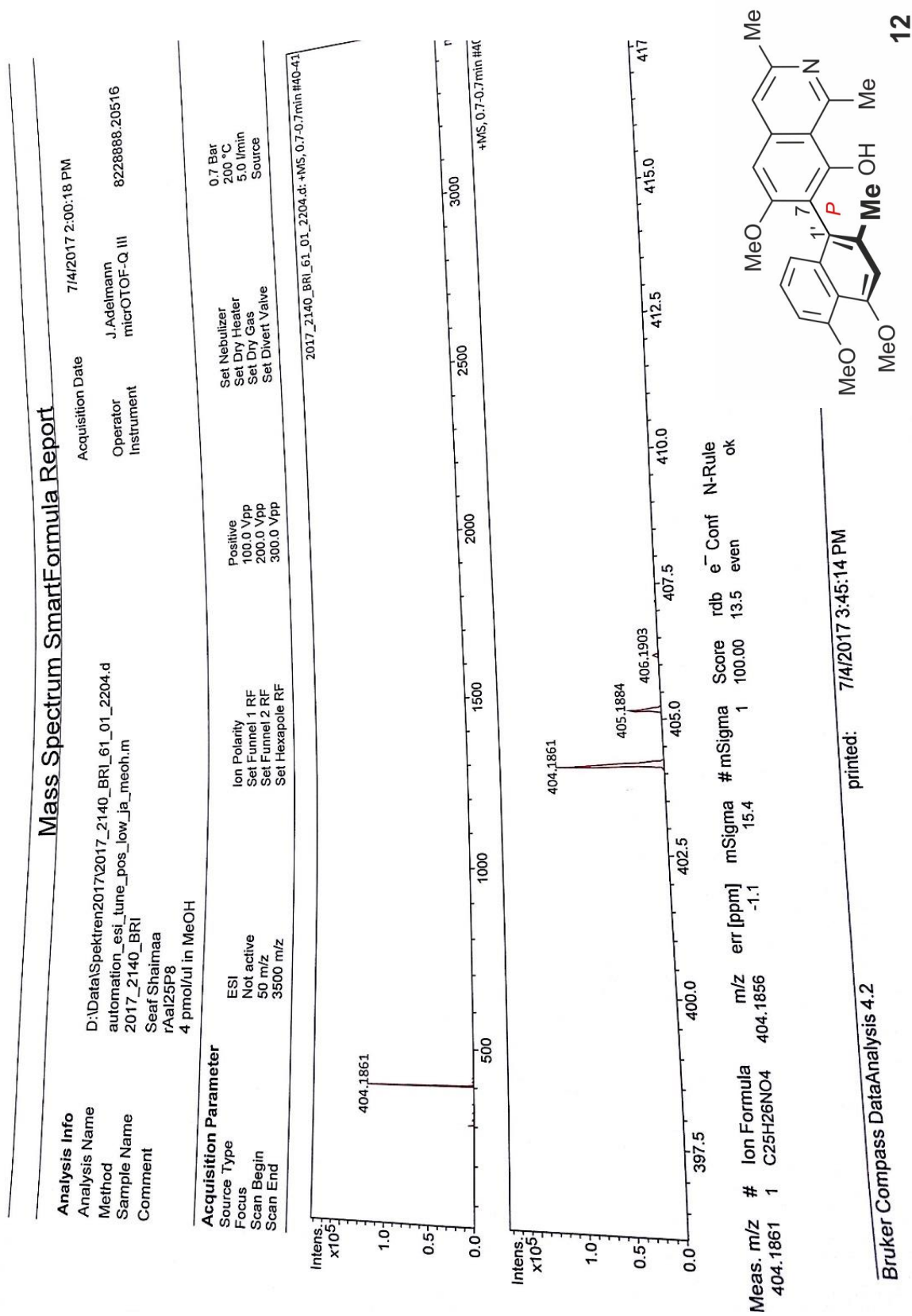
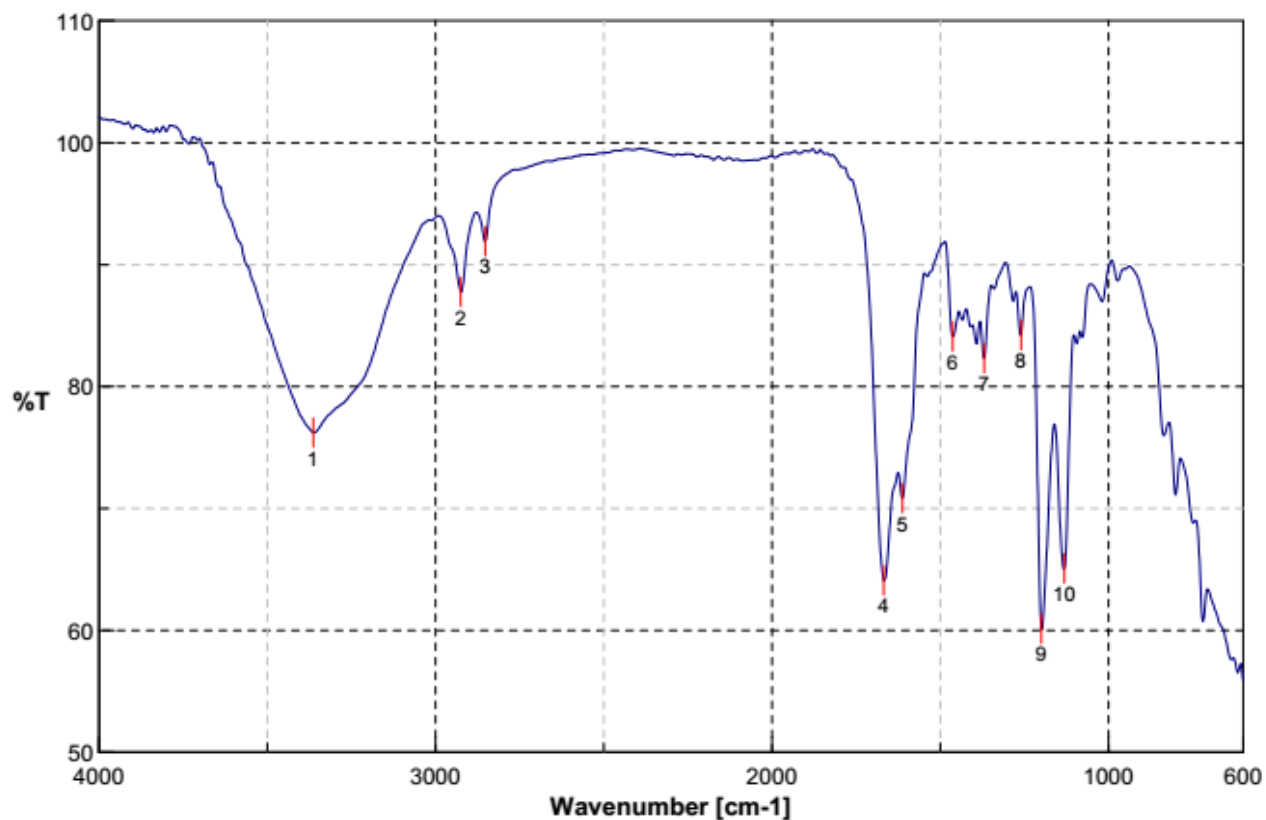
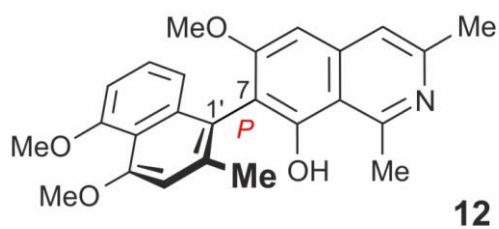


Figure S18. HRESIMS spectrum of ancistrobreveine A (12).



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7	1370.18	82.3196	8	1260.25	84.2404	9	1199.51	60.1309
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Figure S19. IR spectrum ancistrobreveine A (12).

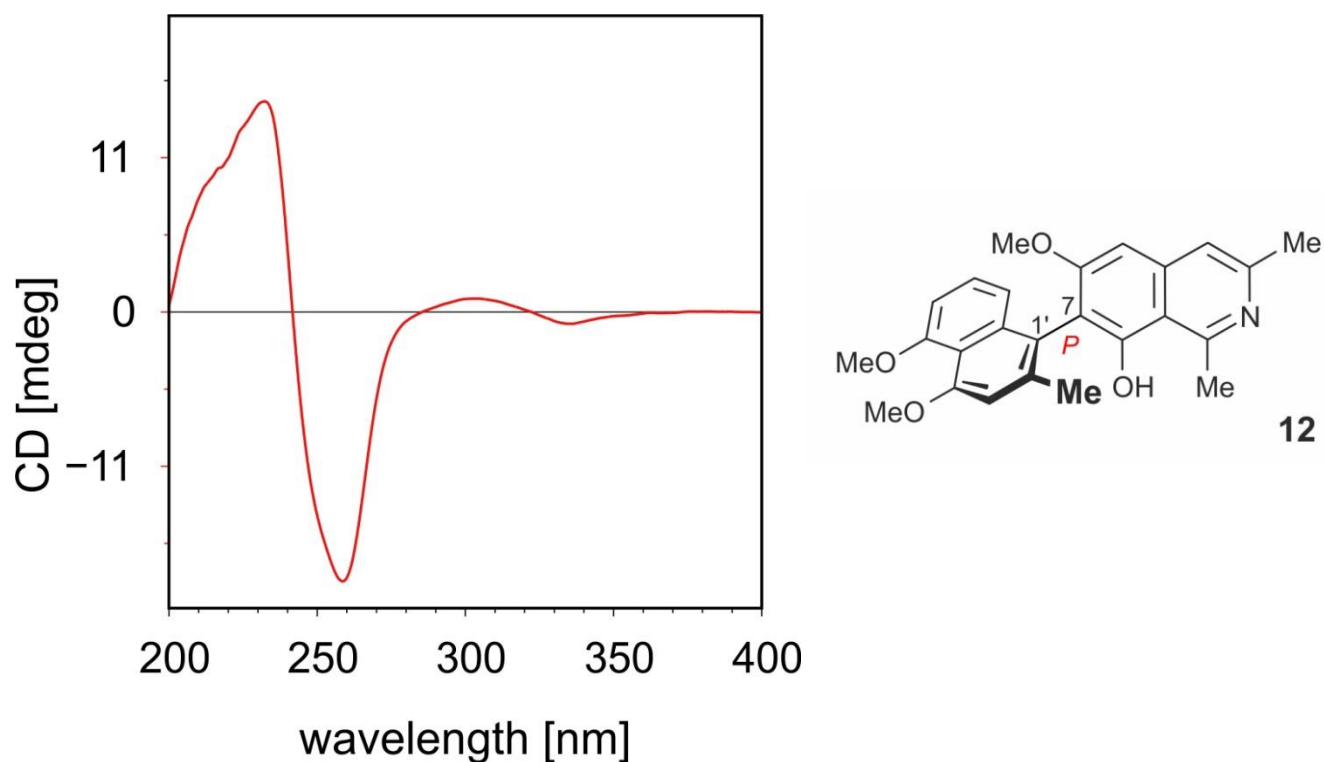


Figure S20. ECD spectrum of ancistrobreveine A (**12**).

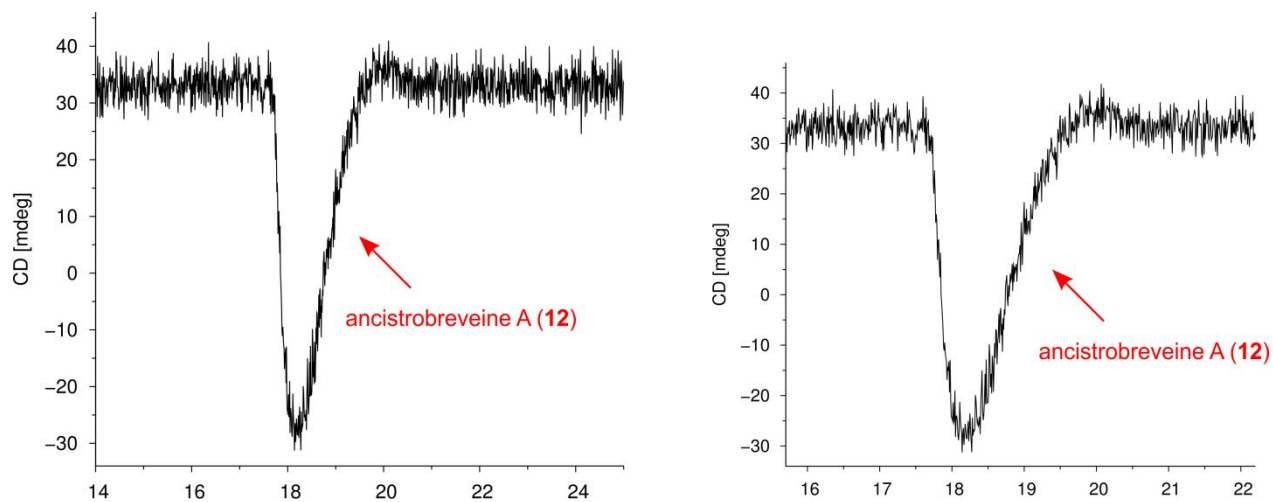


Figure S20b. HPLC-ECD analysis of ancistrobreveine A (**12**) on a chiral phase (Lux Cellulose-1) evidencing that **12** was present in the plant in an enantiopure form, as obvious from the ECD trace of **12** at 258 nm exclusively showing a negative signal: the two chromatograms show an enlarged view of the ECD trace of **12** (chromatography on a Lux Cellulose-1 column (250 × 4.6 mm, 5 μm, Phenomenex) with H₂O (0.05% trifluoroacetic acid) and MeCN (0.05% trifluoroacetic acid) as the eluents).

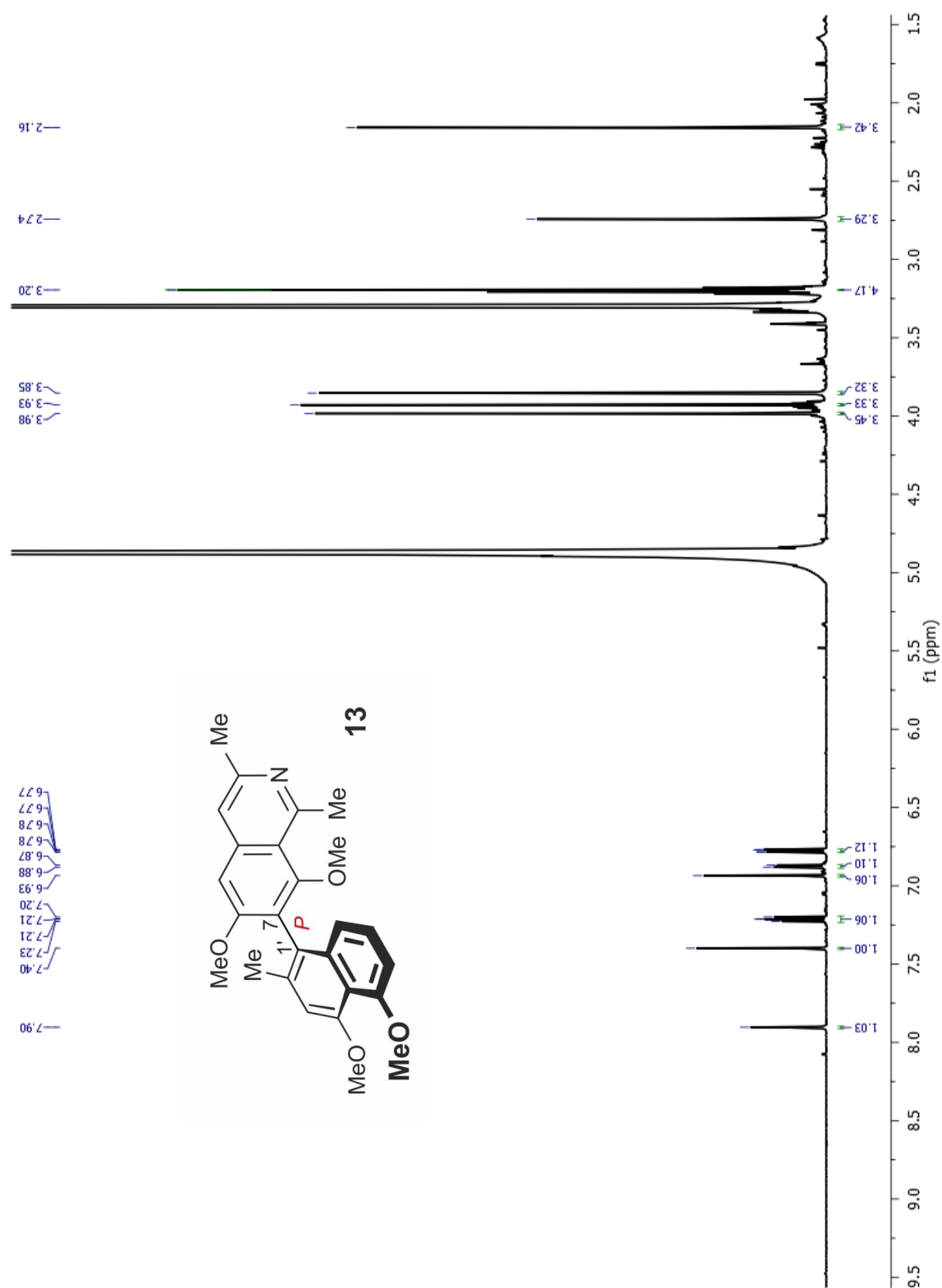


Figure S21. ¹H NMR spectrum of ancistrobreveine B (**13**).

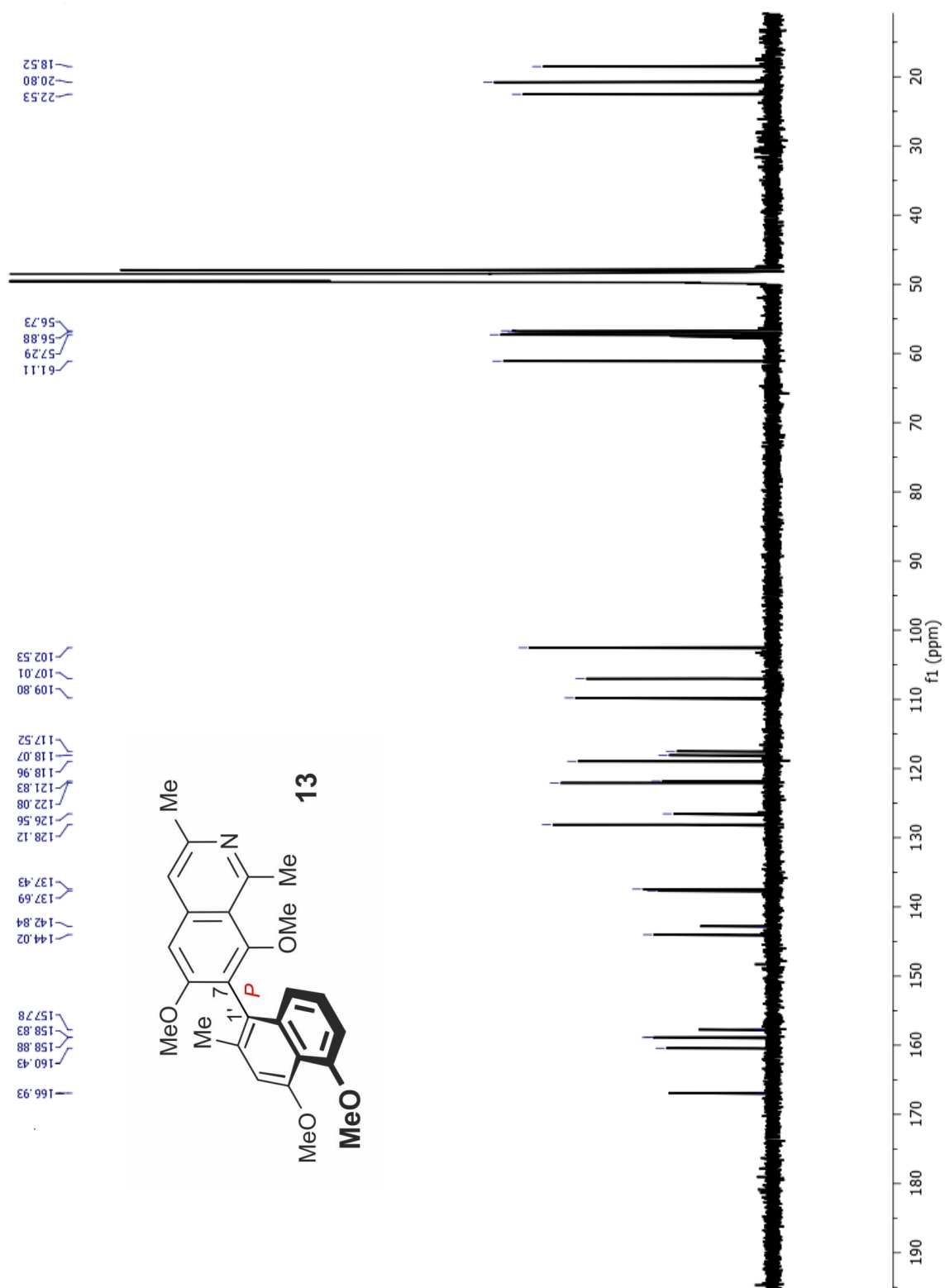


Figure S22. ^{13}C NMR spectrum of ancistrobreveine B (13).

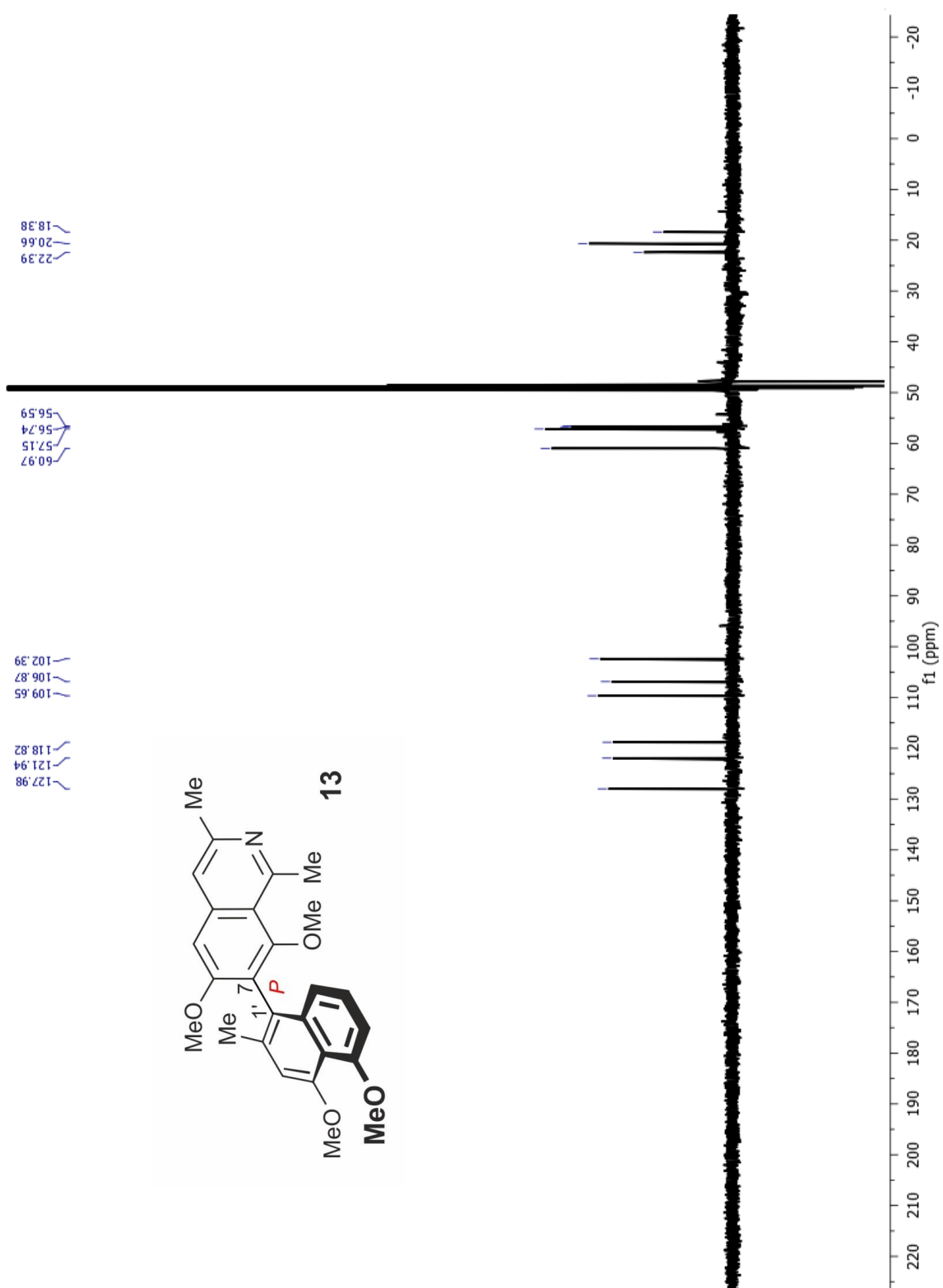


Figure S23. ¹³C DEPT-135 spectrum of ancistrobreveine B (13).

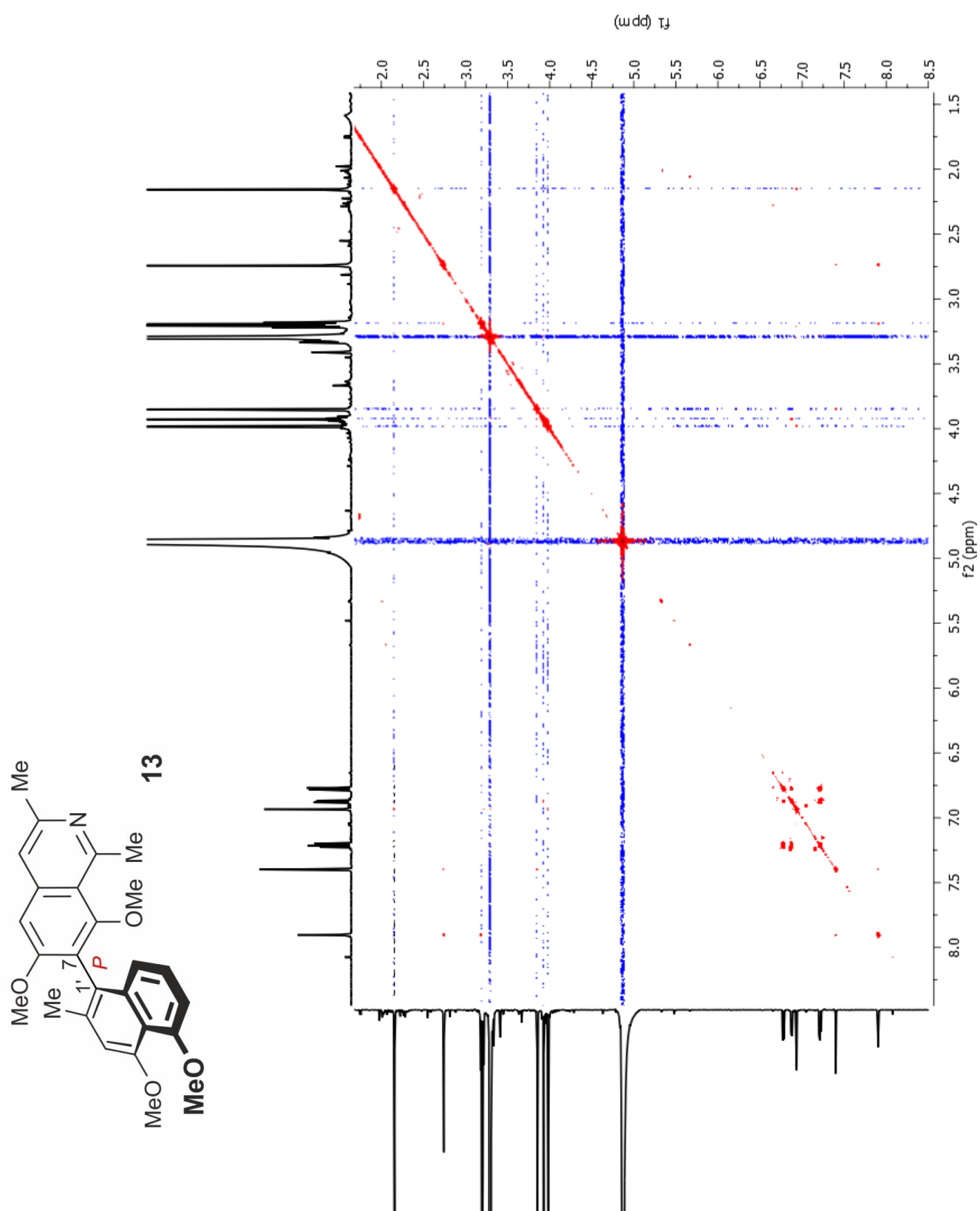


Figure S24. COSY spectrum of ancistrobreveine B (**13**).

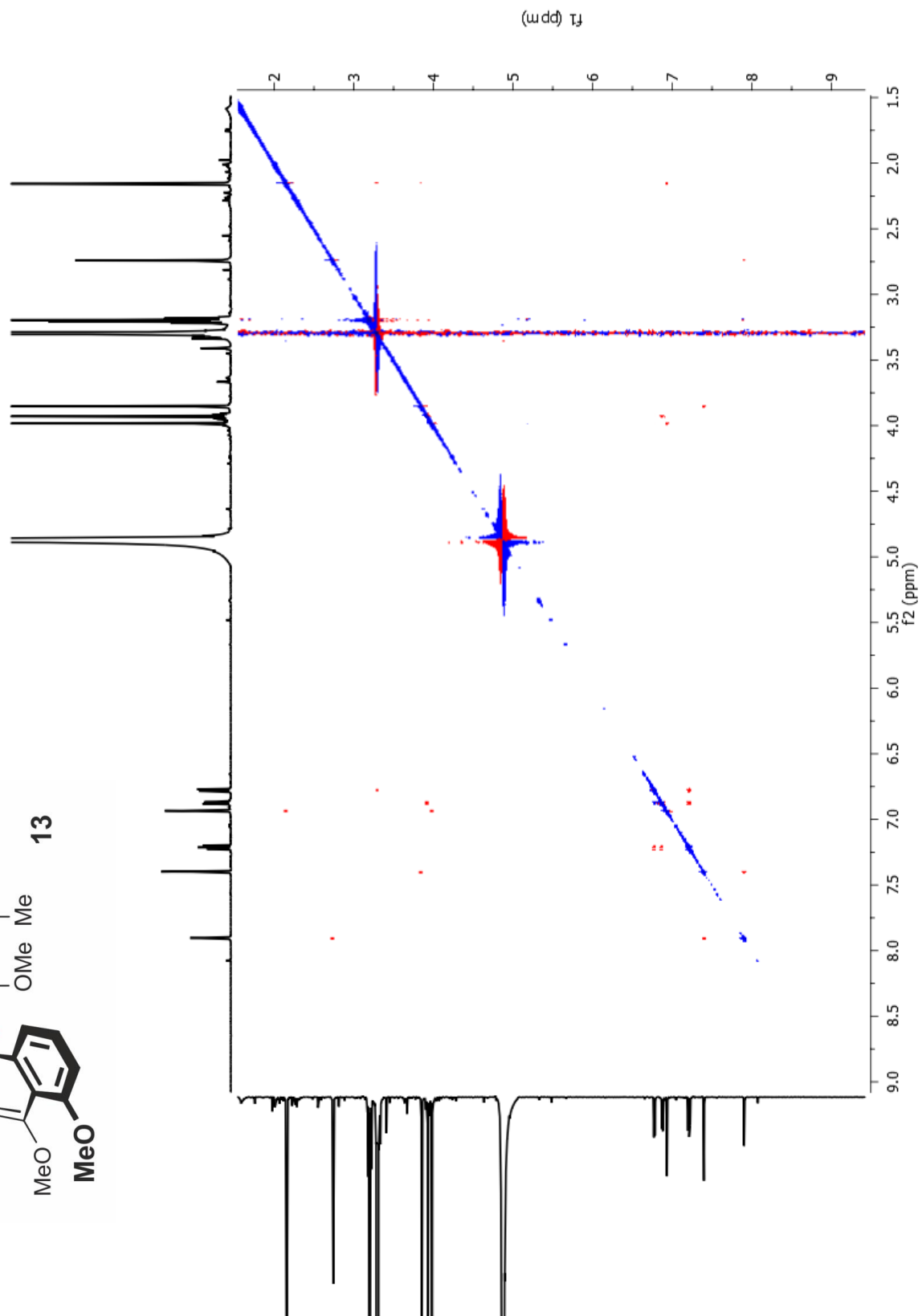
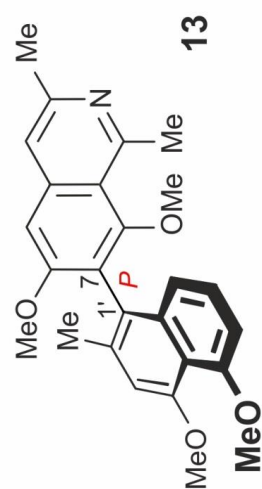


Figure S25. ^1H - ^1H NOESY spectrum of ancistrobreveine B (**13**).

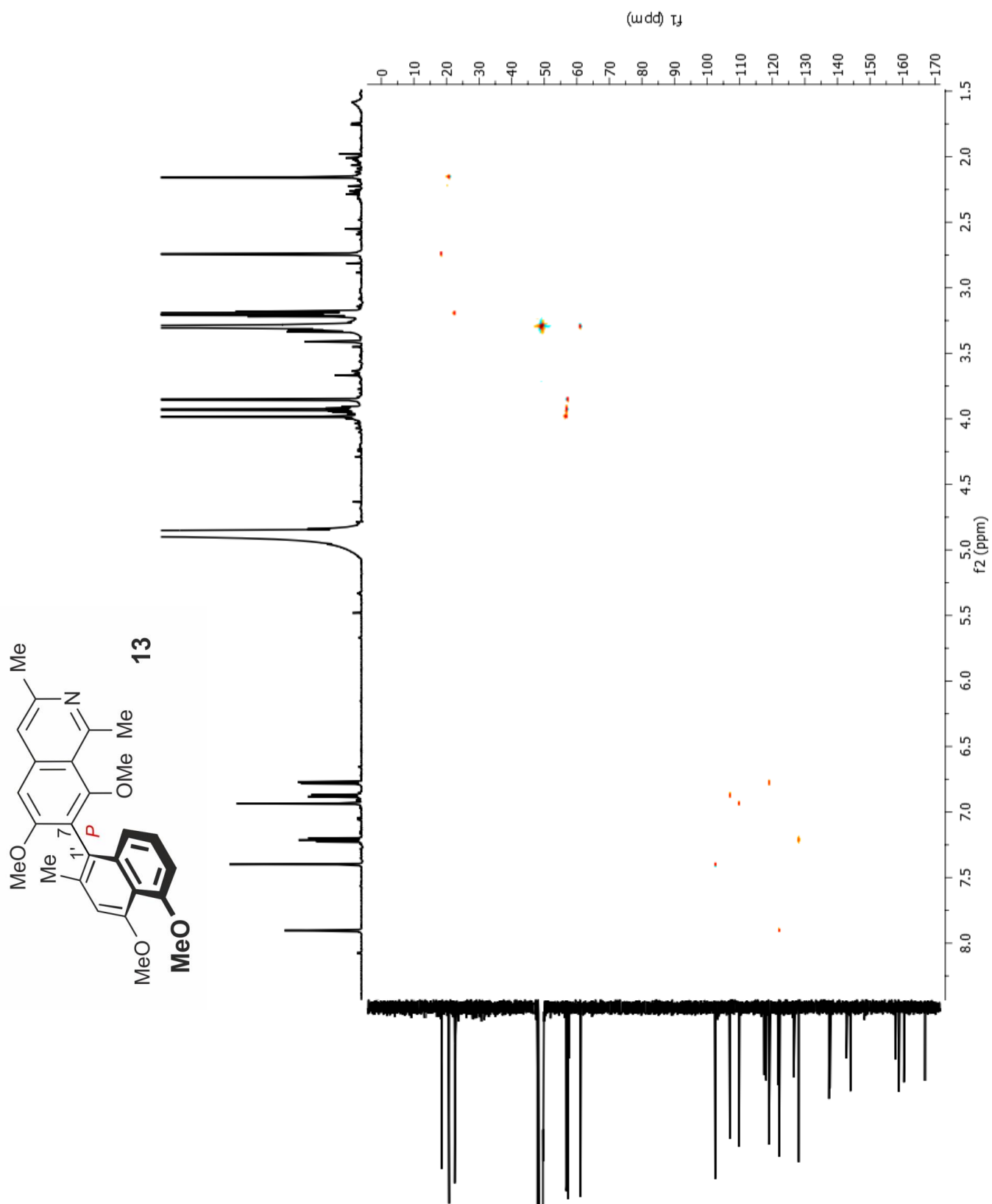


Figure S26. HSQC spectrum of ancistrobrevine B (13).

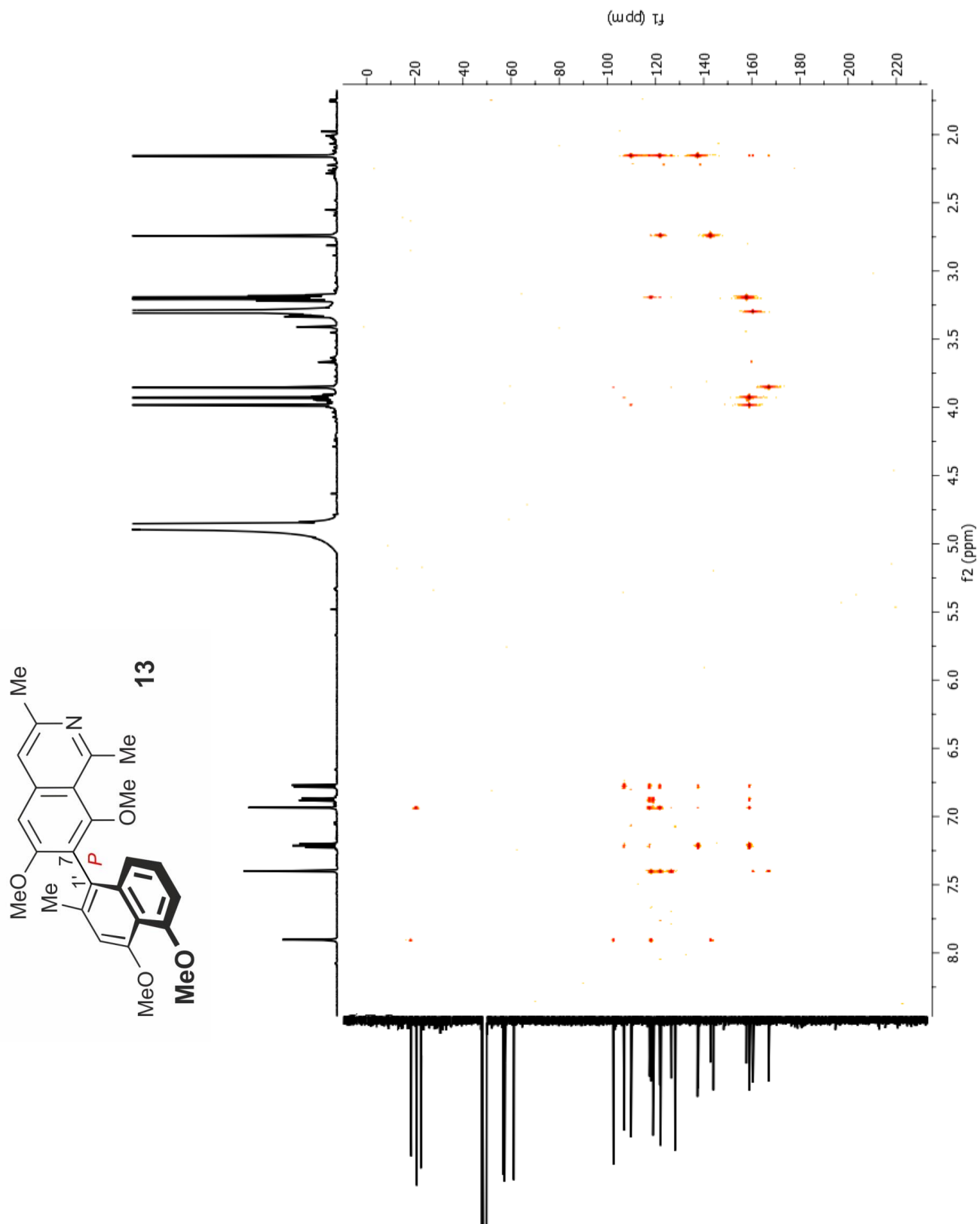


Figure S27. HMBC spectrum of ancistrobrevine B (13).

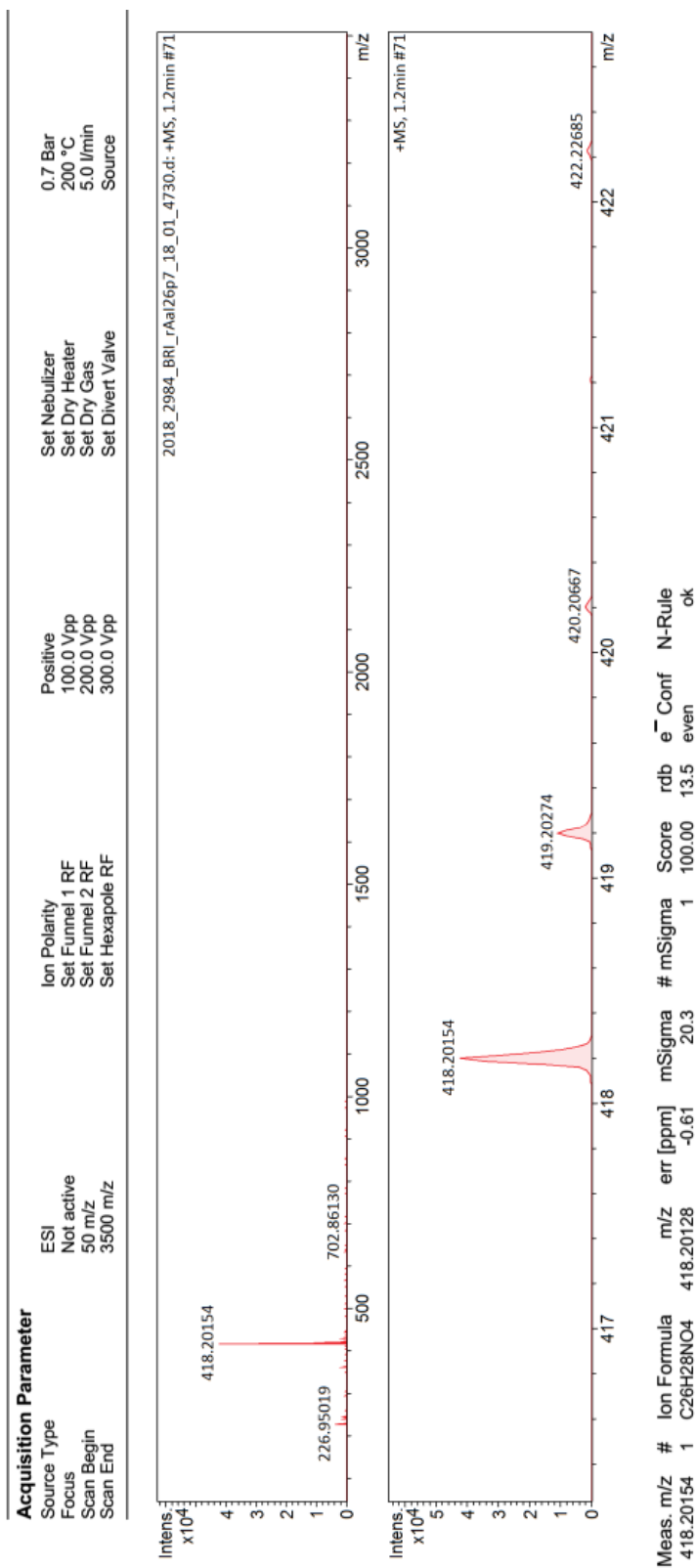
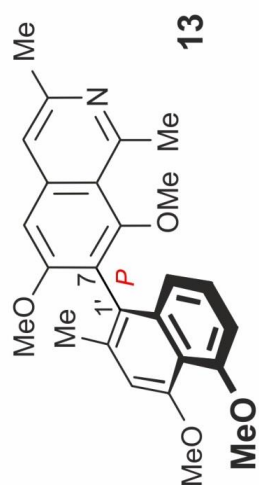
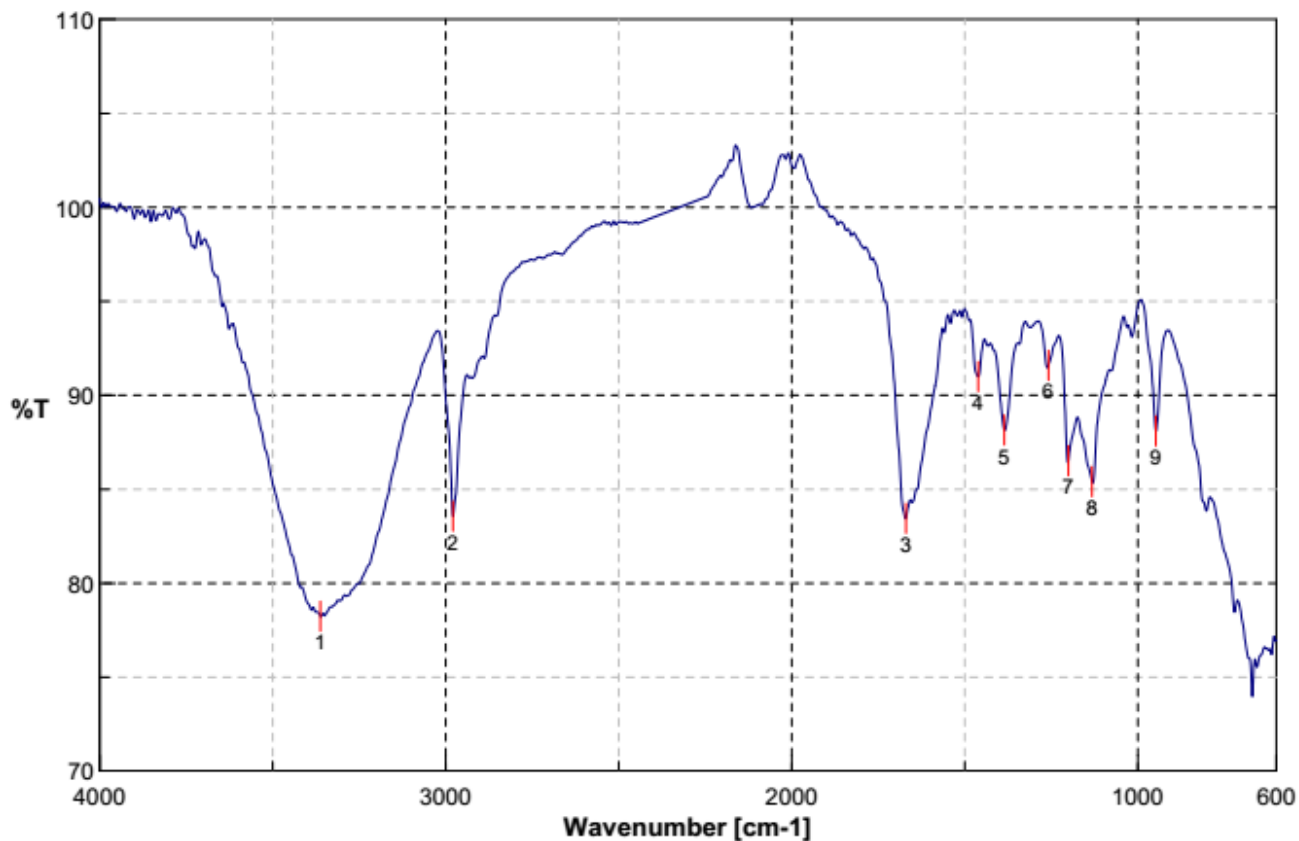
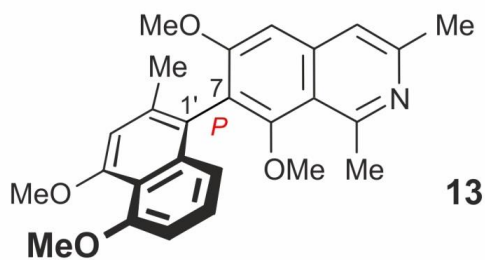


Figure S28. HRESIMS spectrum of ancistrobreveine B (**13**).



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Figure S29. IR spectrum ancistrobreveine B (13).

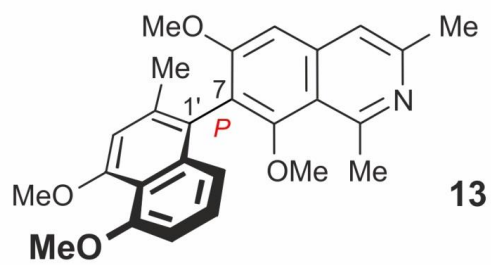
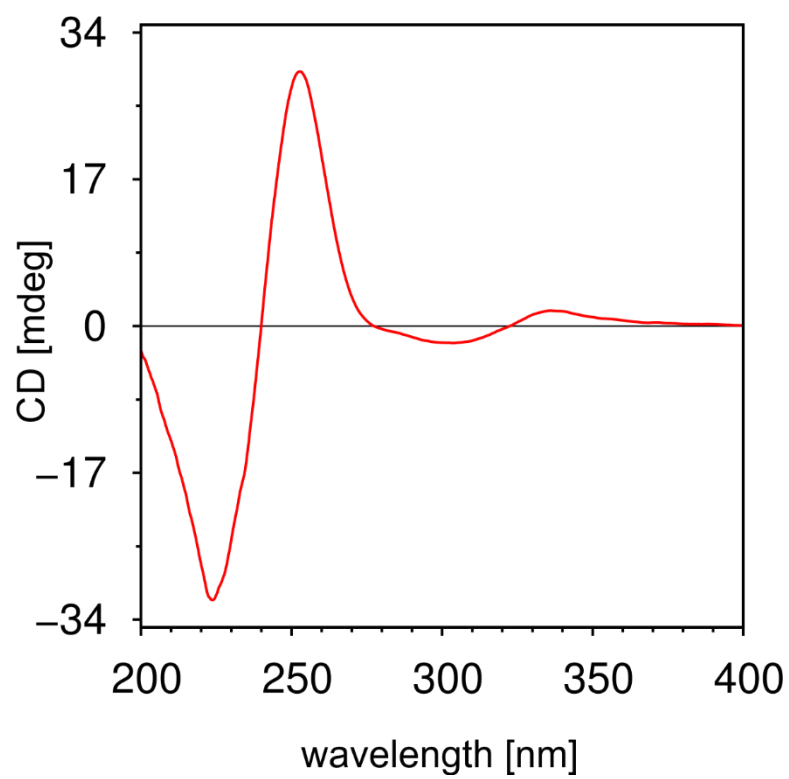


Figure S30. ECD spectrum of ancistrobreveine B (**13**).

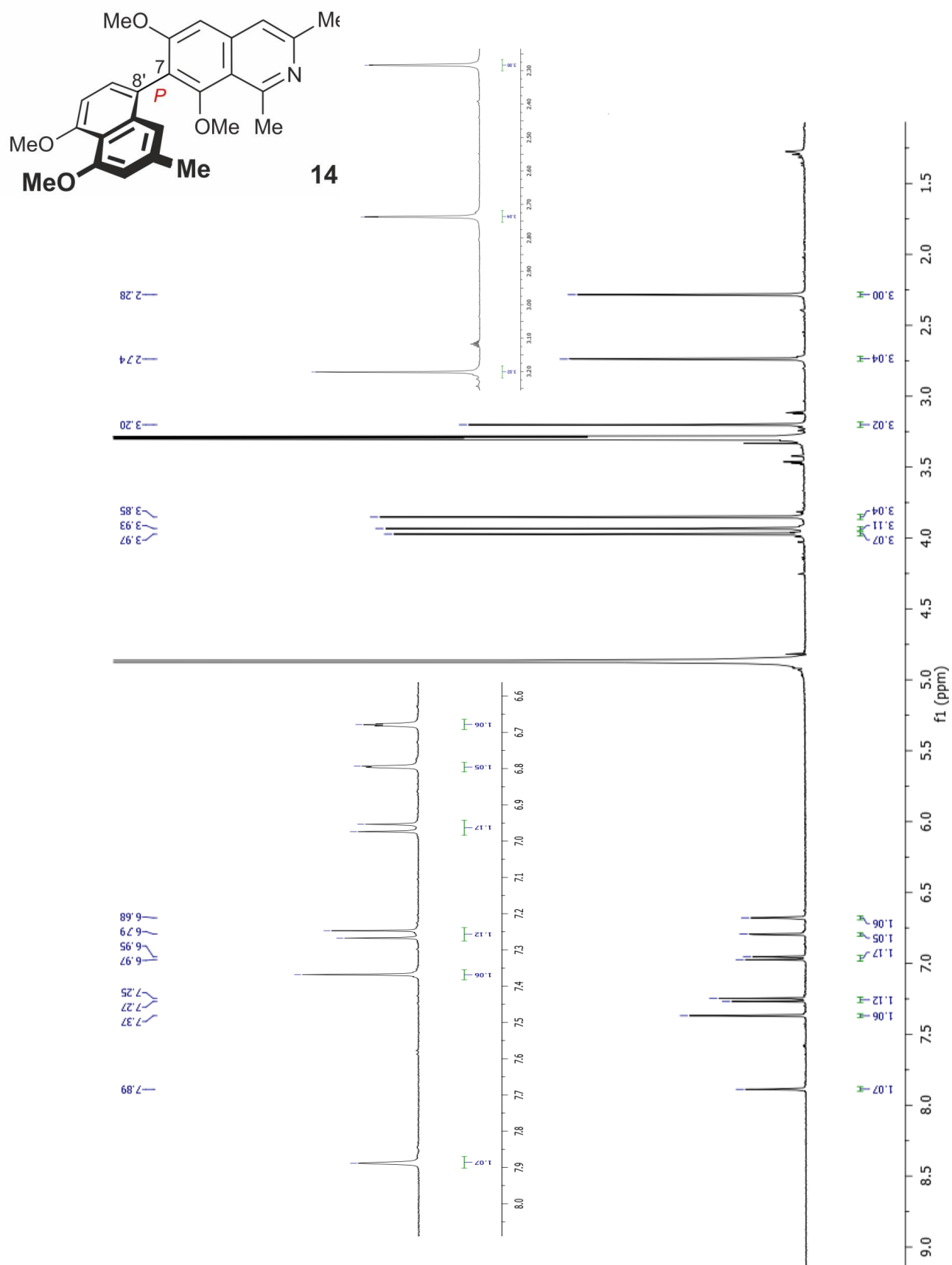


Figure S31. ^1H NMR spectrum of ancistrobreveine C (**14**).

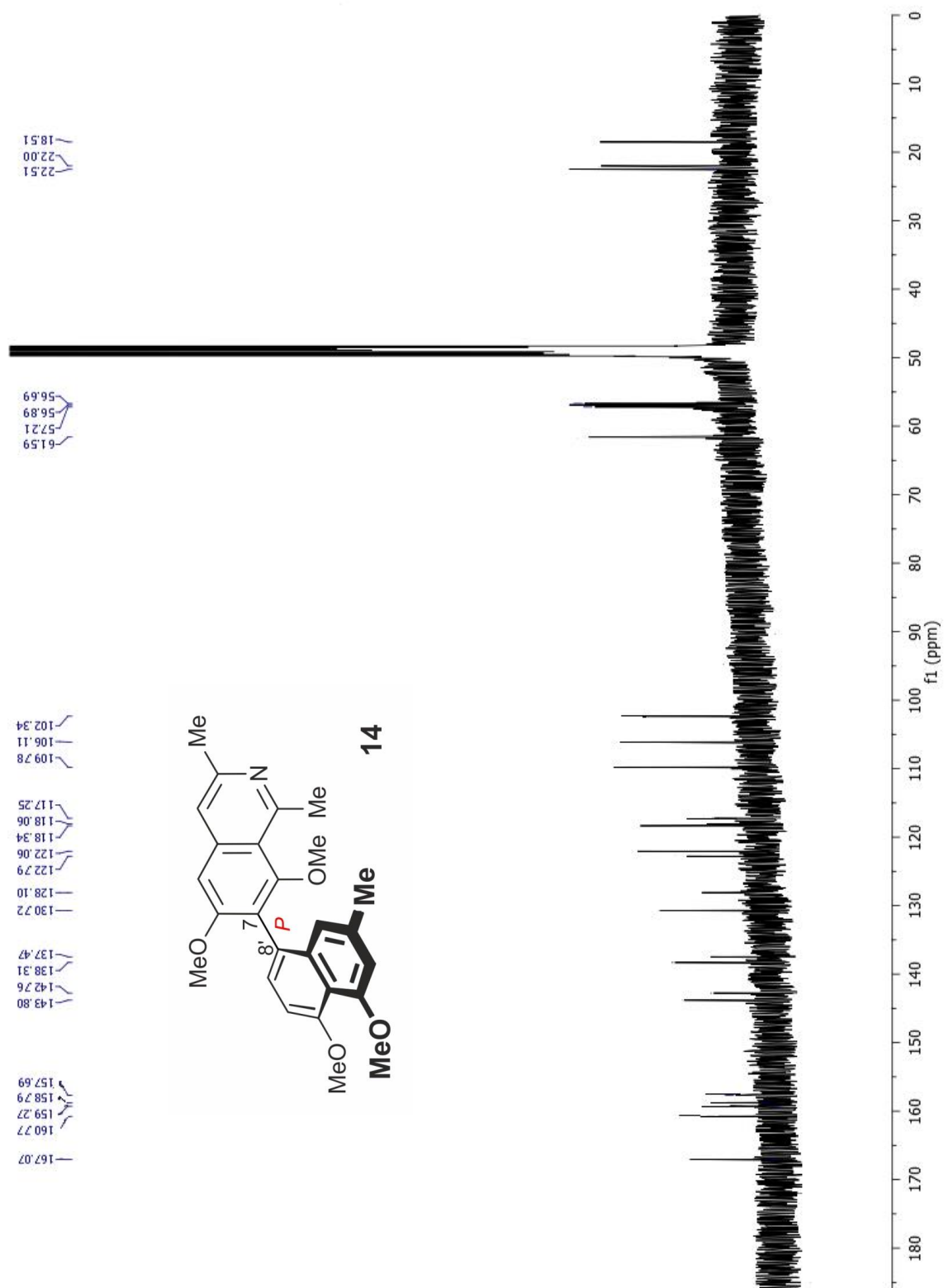


Figure S32. ¹³C NMR spectrum of ancistrobreveine C (14).

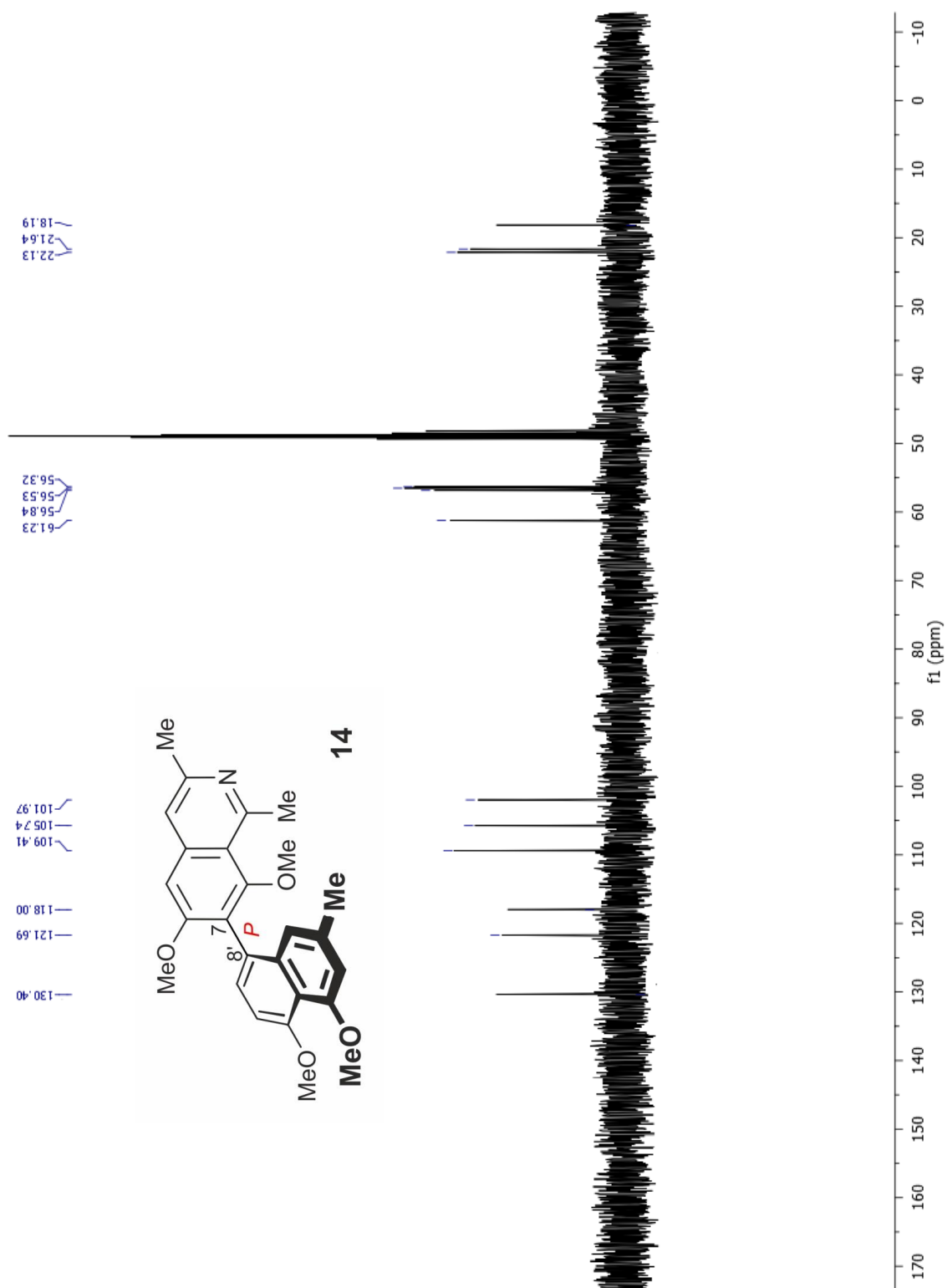


Figure S33. ^{13}C DEPT-135 spectrum of ancistrobreveine C (14).

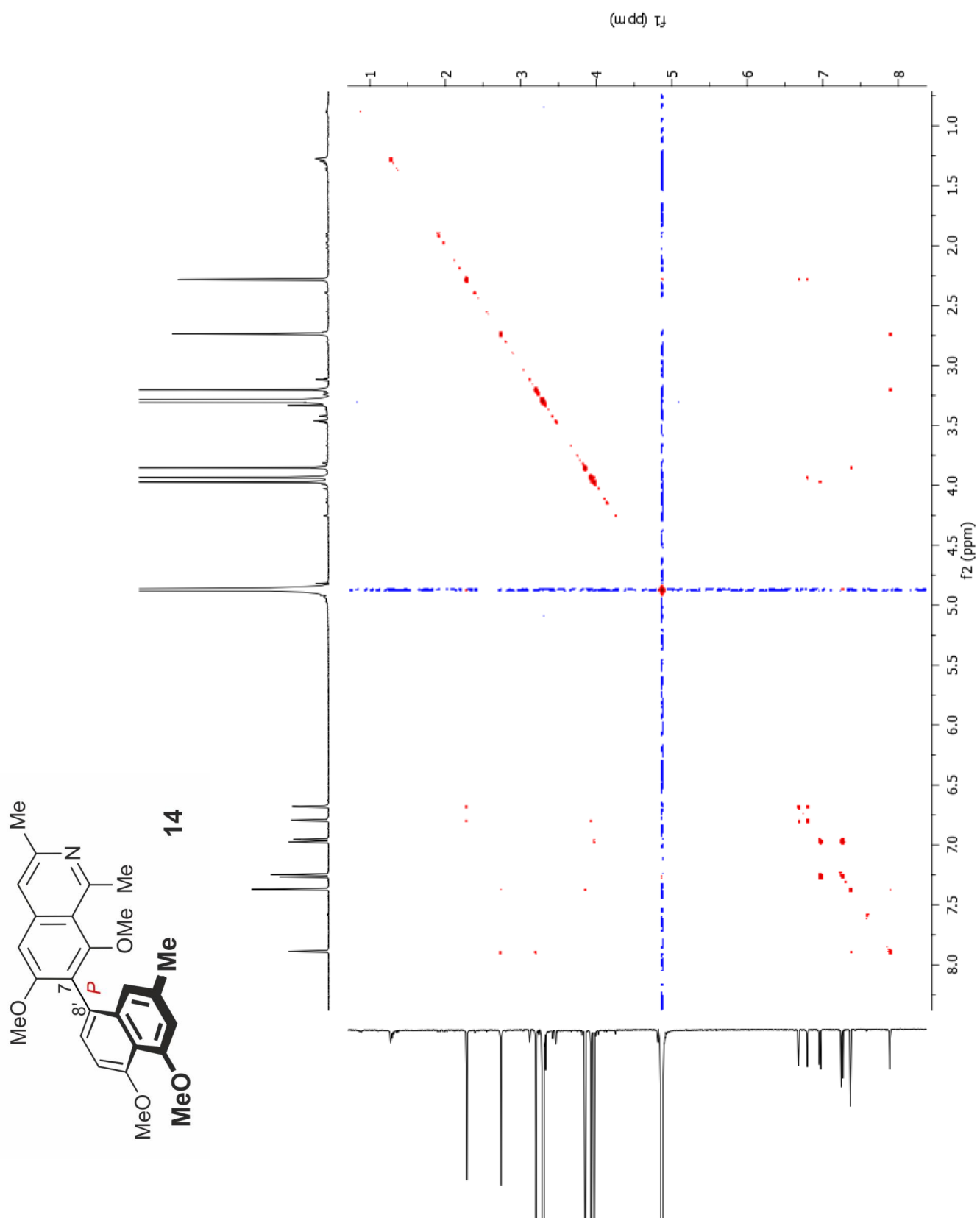


Figure S34. COSY spectrum of ancistrobreveine C (**14**).

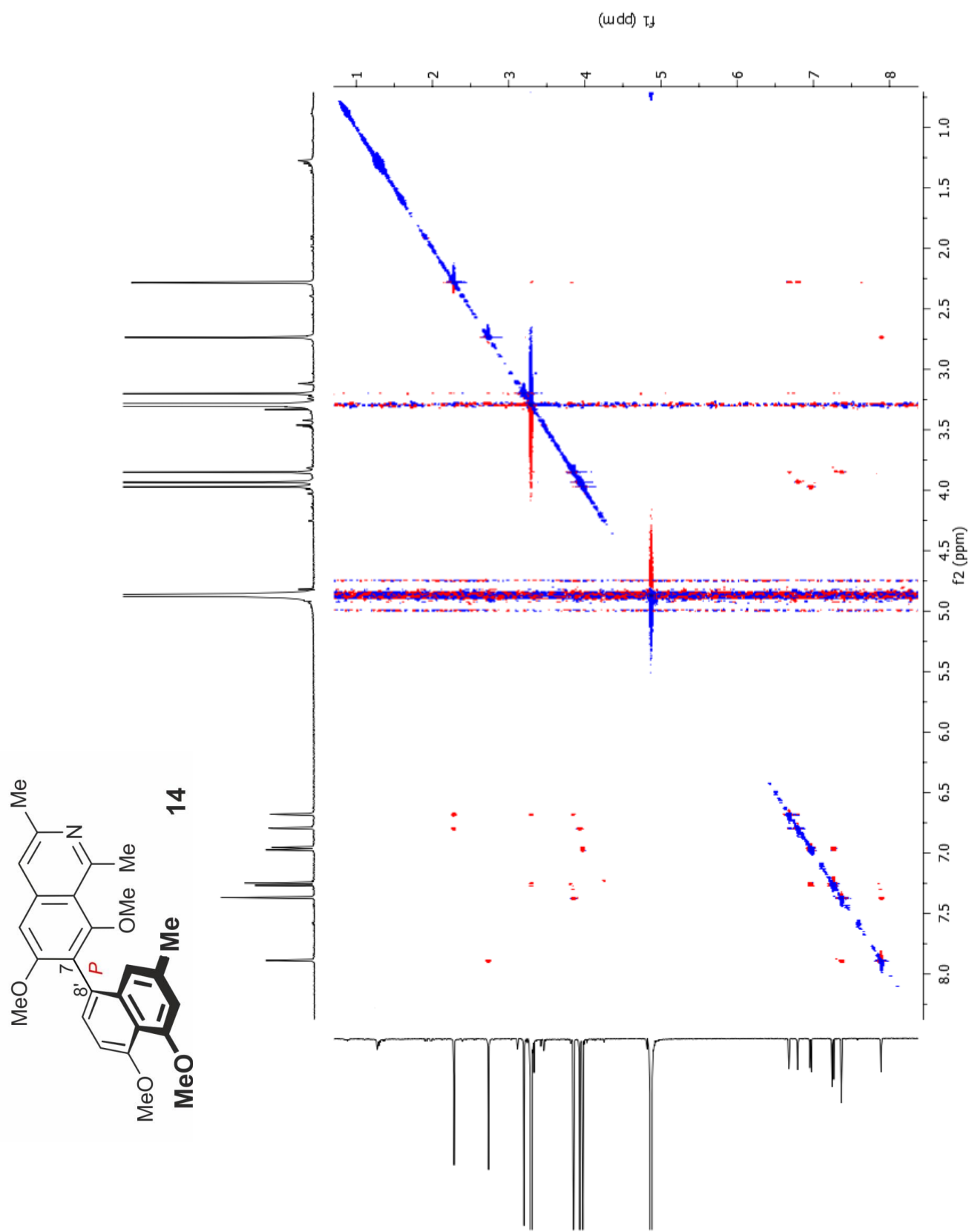


Figure S35. ^1H - ^1H NOESY spectrum of ancistrobrevine C (**14**).

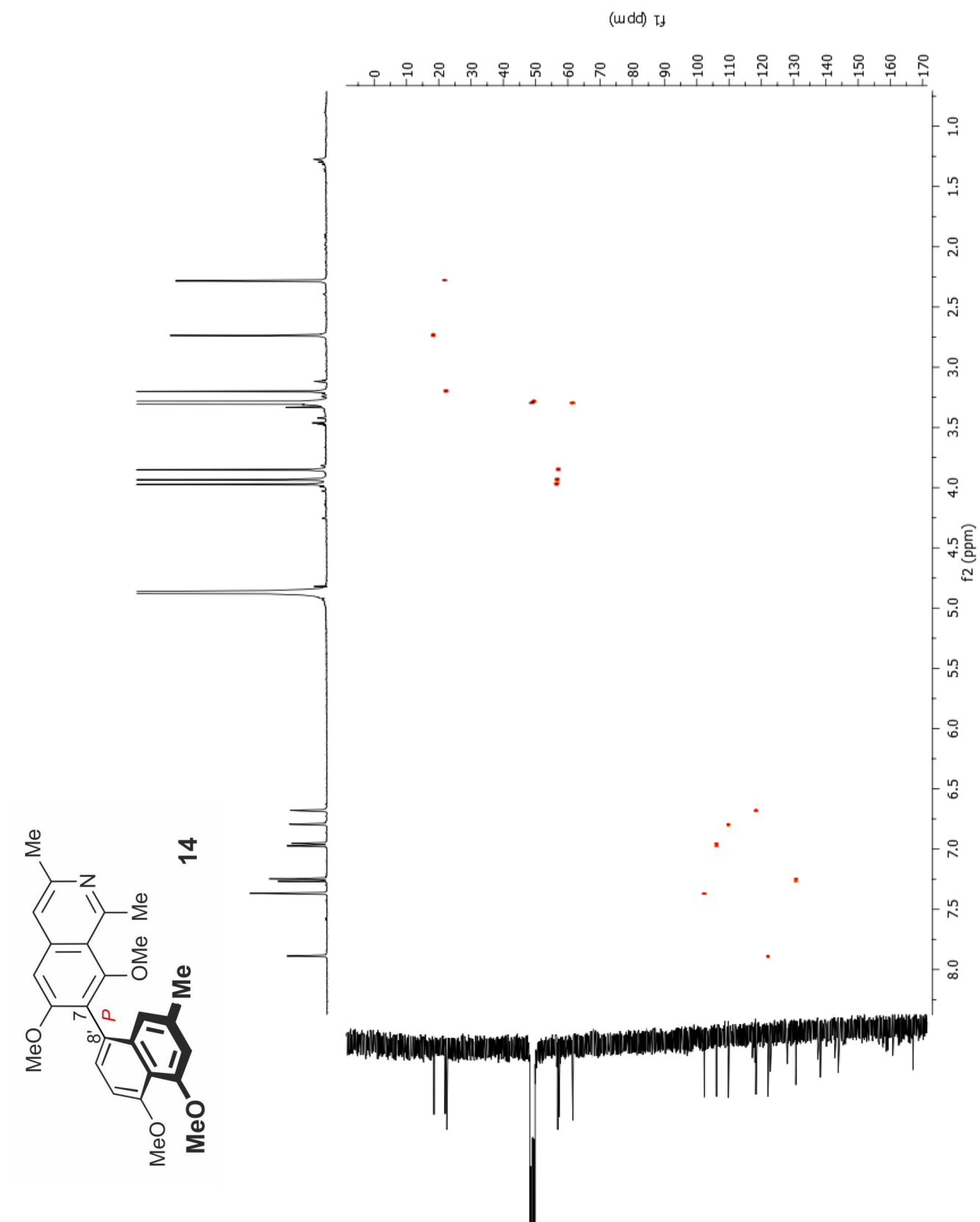


Figure S36. HSQC spectrum of ancistrobreveine C (14).

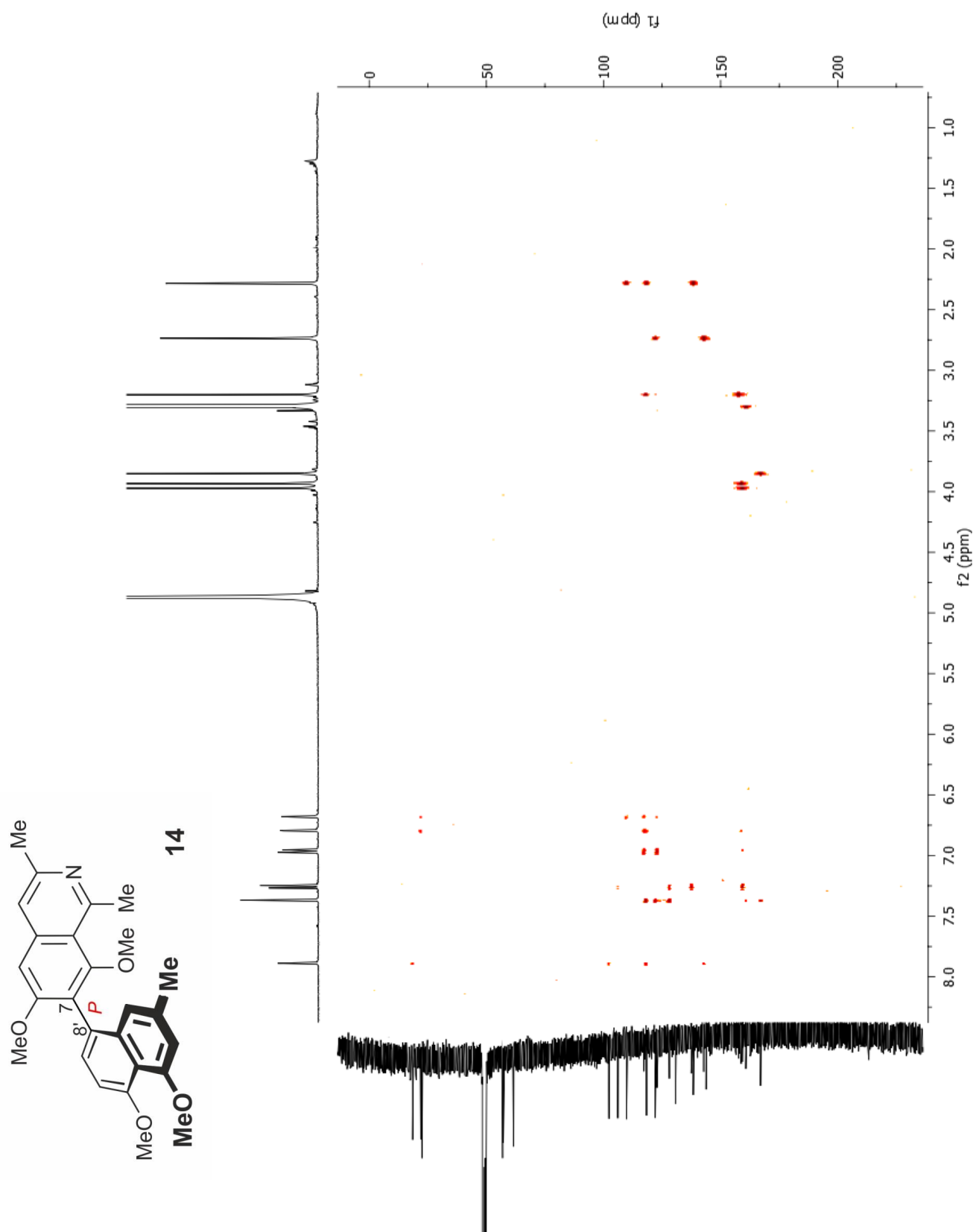


Figure S37. HMBC spectrum of ancistrobreveine C (**14**).

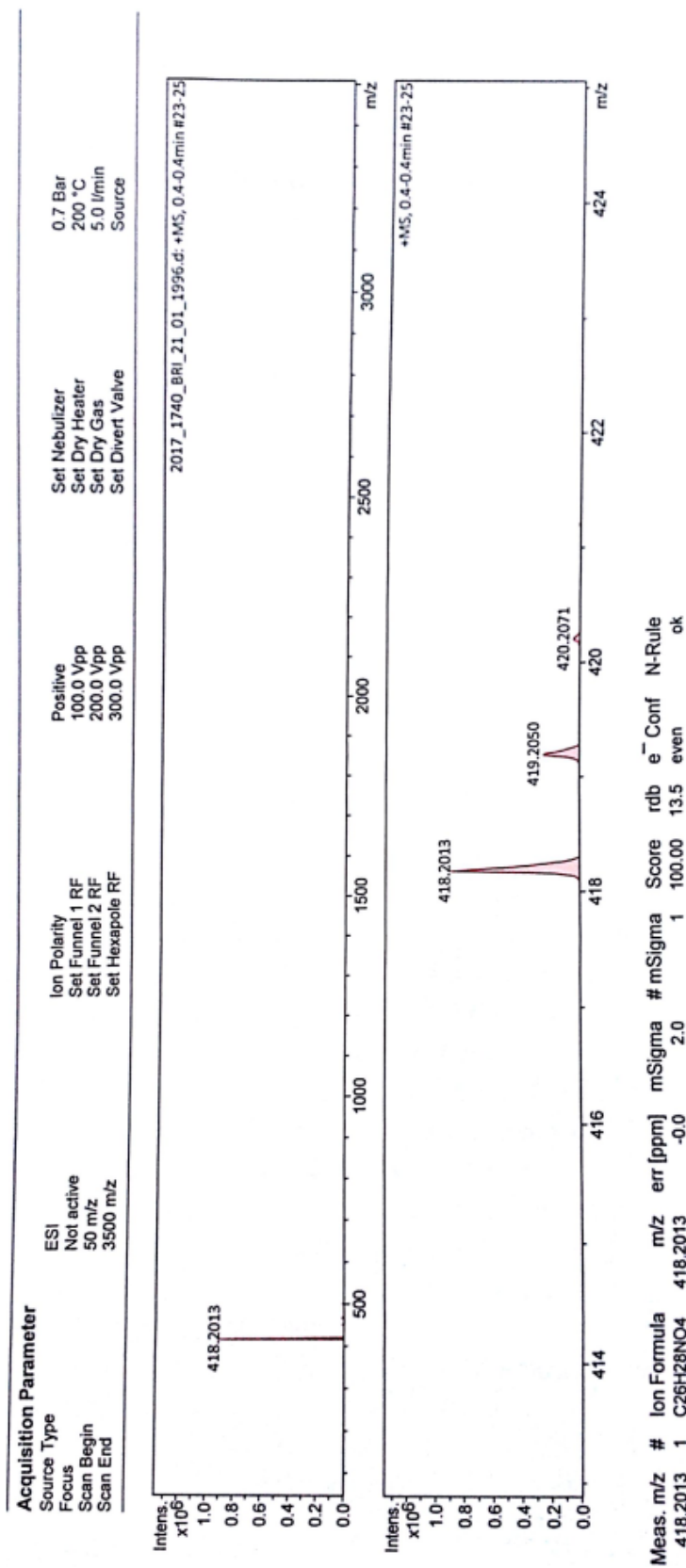
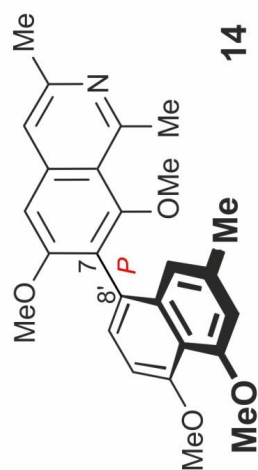
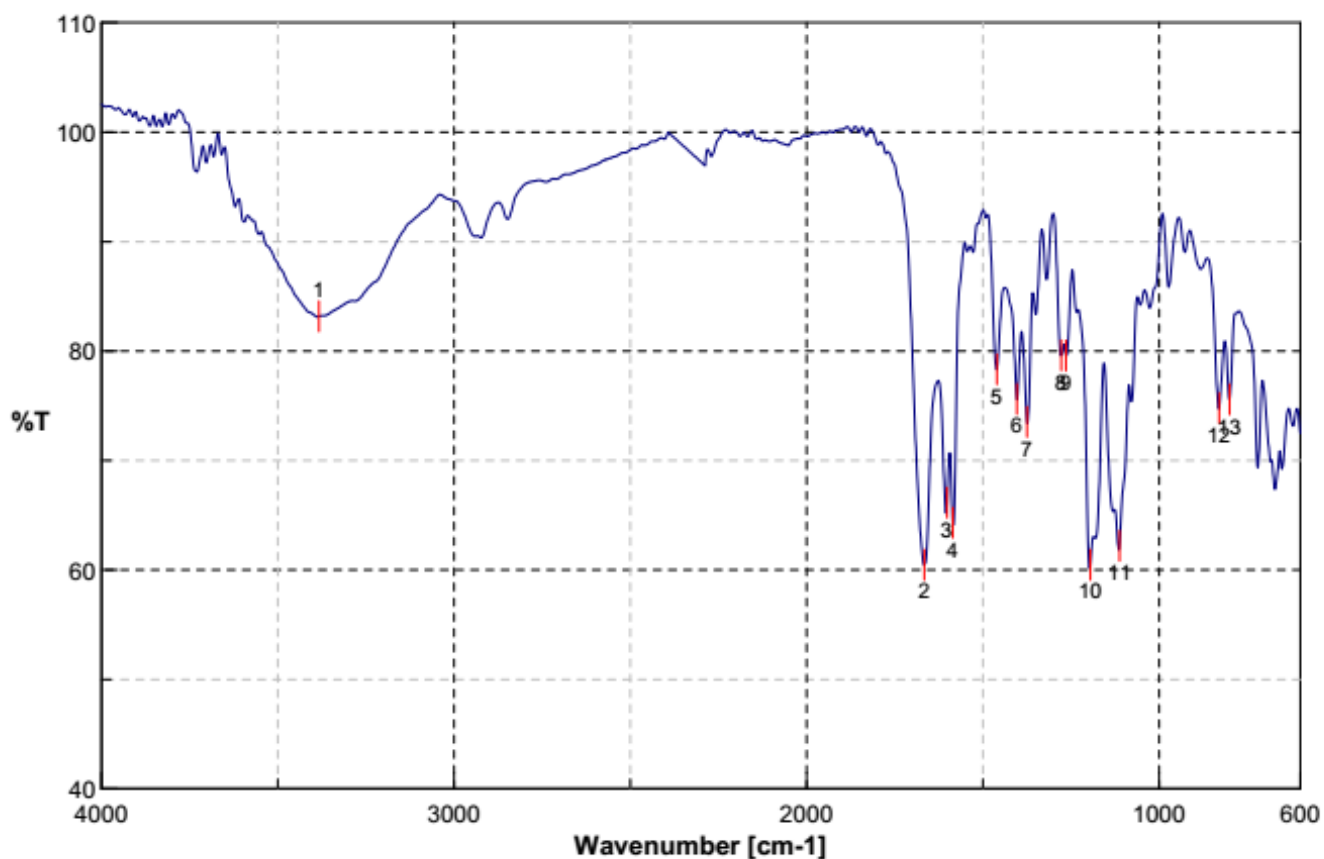
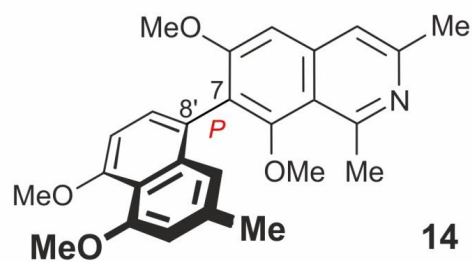


Figure S38. HRESIMS spectrum of ancistrobreveine C (**14**).



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 Date/Time 23.10.2017 10:07
 Update 23.10.2017 10:41
 Operator Student
 File Name Memory#1
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4	1585.2	64.3368	5	1460.81	78.3459	6	1403.92	75.6092
7	1375	73.5419	8	1277.61	79.624	9	1264.11	79.5896
10	1195.65	60.4673	11	1112.73	62.222	12	830.205	74.7828
13	800.314	75.6048						

Figure S39. IR spectrum ancistrobreveine C (**14**).

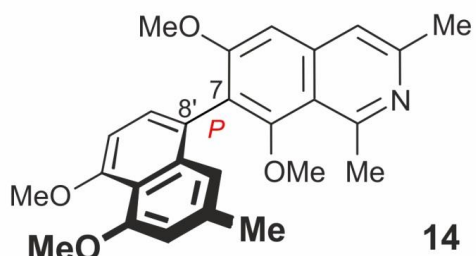
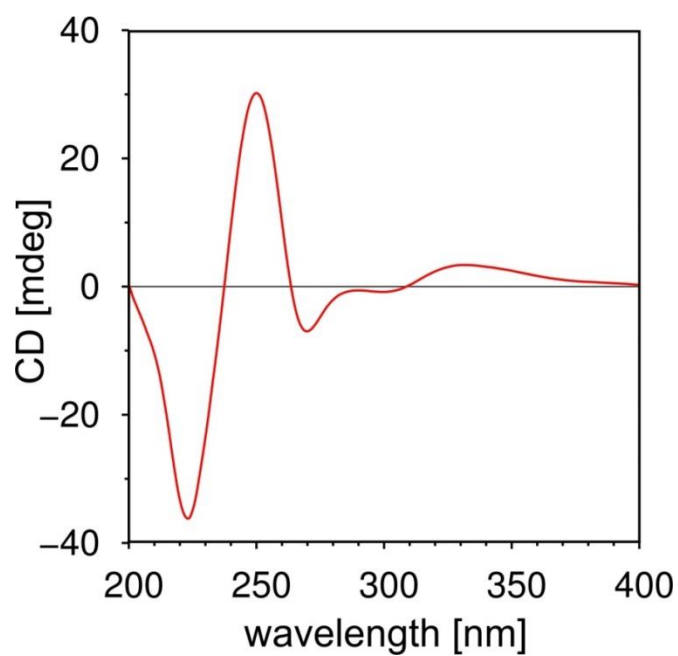


Figure S40a. ECD spectrum of ancistrobreveine C (**14**).

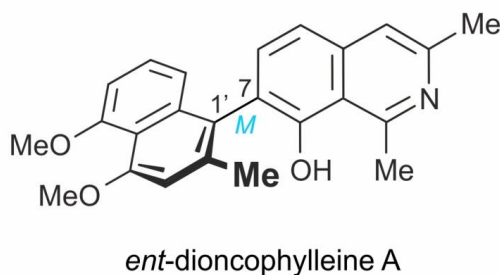
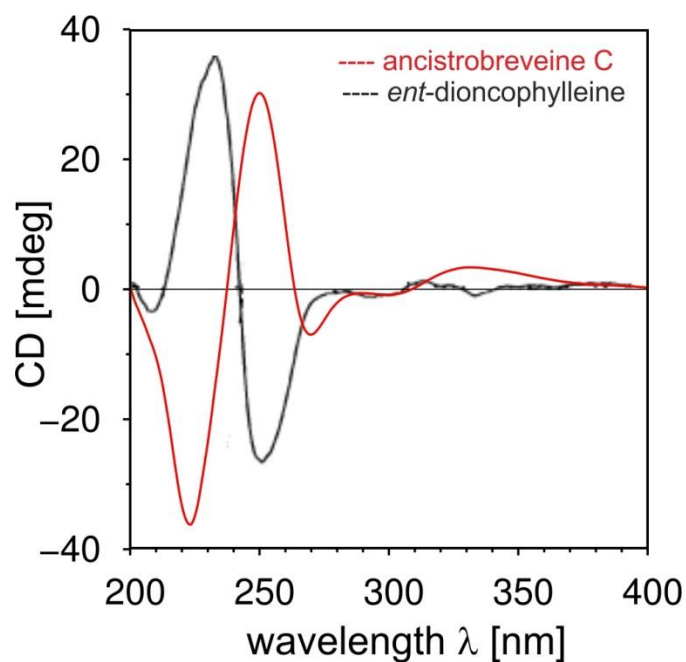


Figure S40b. Comparison of the ECD spectrum of ancistrobreveine C (**14**) with that of the structurally closely related 7,1'-coupled, but *M*-configured alkaloid *ent*-dioncophylleine A (*ent*-**10**).

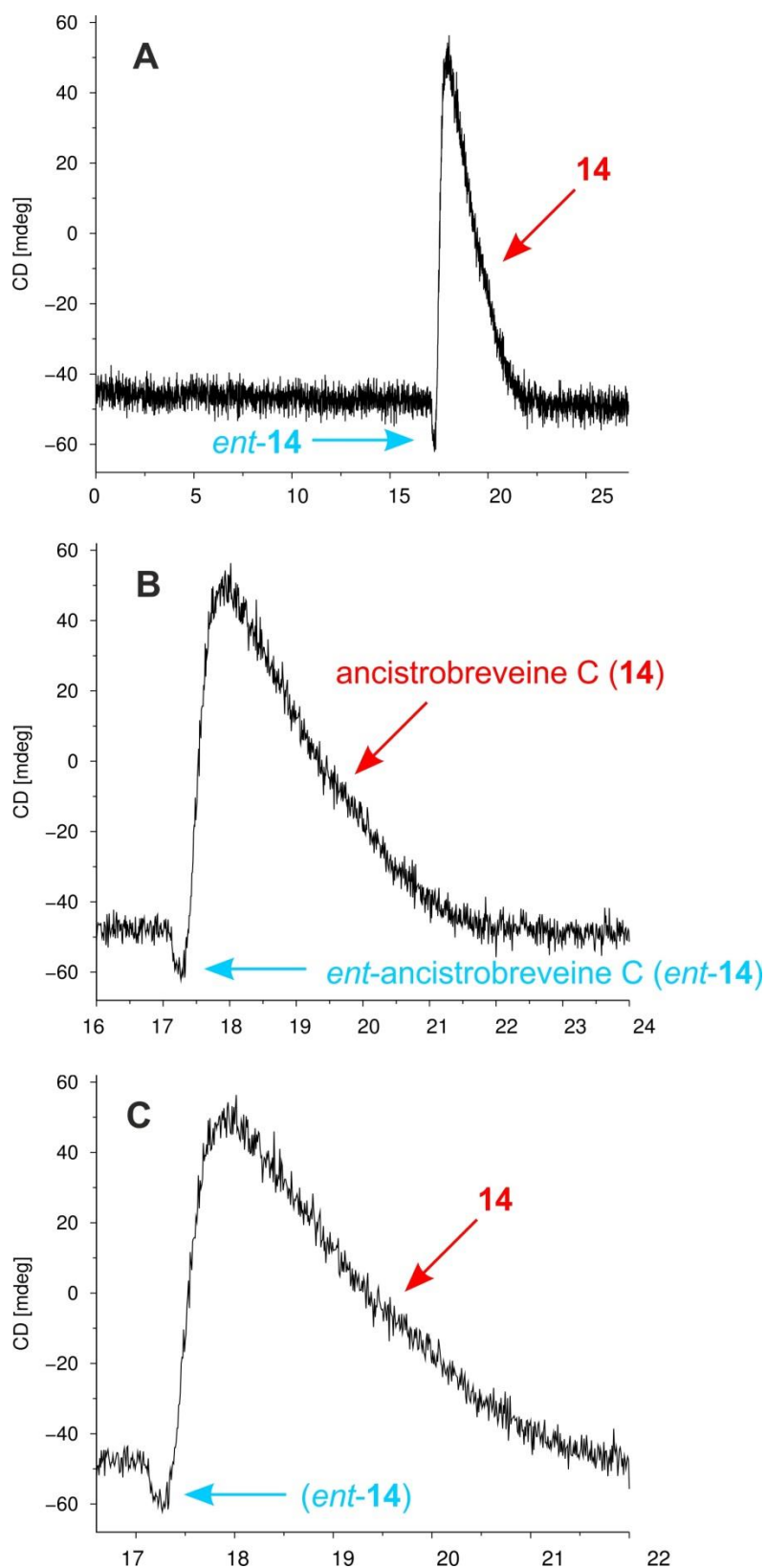


Figure S40c. HPLC-ECD analysis of ancistrobreveine C (**14**) on a chiral phase (Lux Cellulose-1, chromatogram A) evidencing **14** to be present in the plant only in a nearly enantiopure form, as obvious from the ECD trace of **14** at 255 nm showing a negative signal at the rising slope of the peak and a huge positive one on the descending side: chromatogram A (enlarged view of A in B and C) obtained on a Lux Cellulose-1 column (250 × 4.6 mm, 5 μ m, Phenomenex) with H₂O (0.05% trifluoroacetic acid) and MeCN (0.05% trifluoroacetic acid) as the eluents.

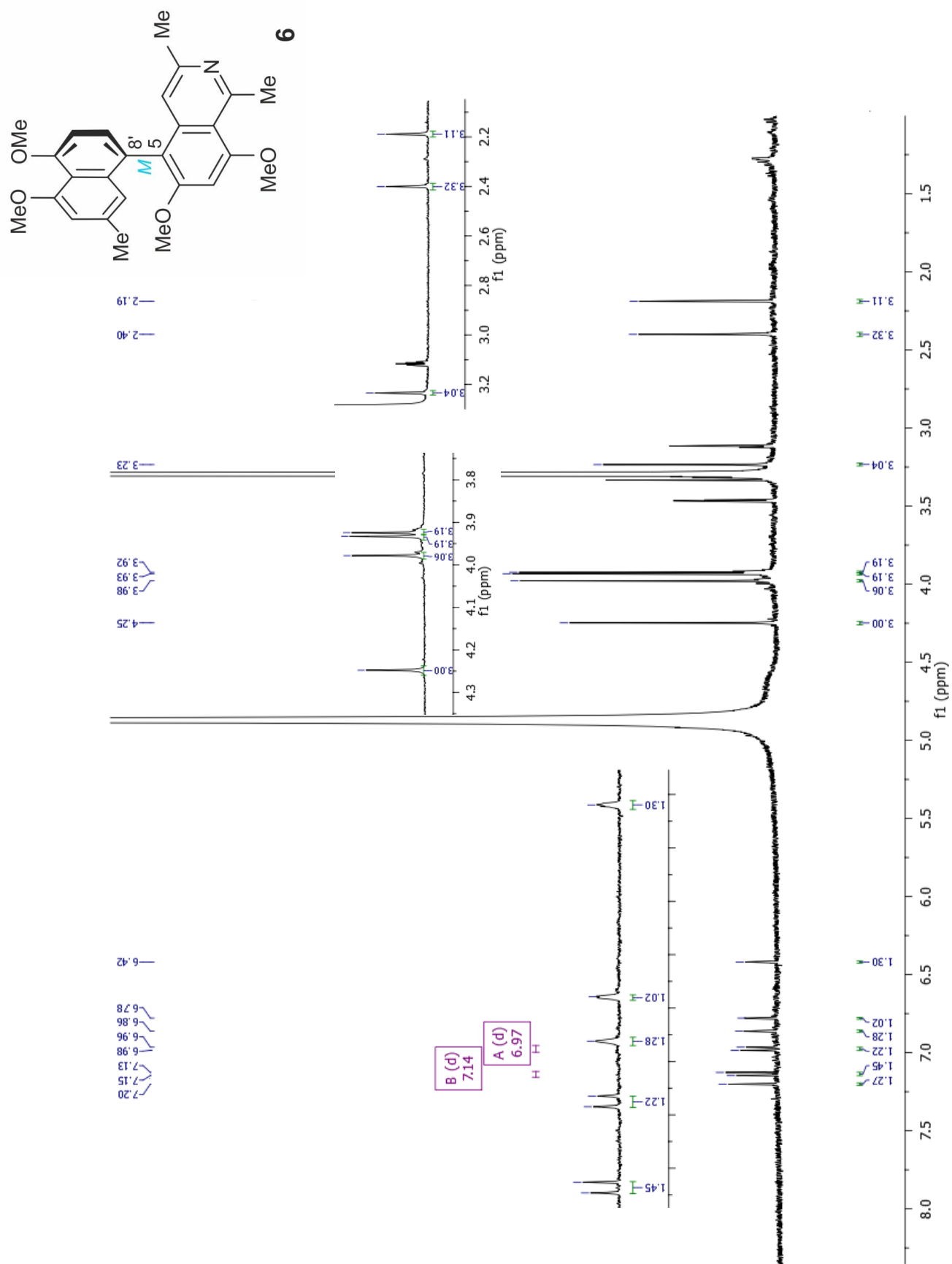


Figure S41. ^1H NMR spectrum of ancistrobreveine D (6).

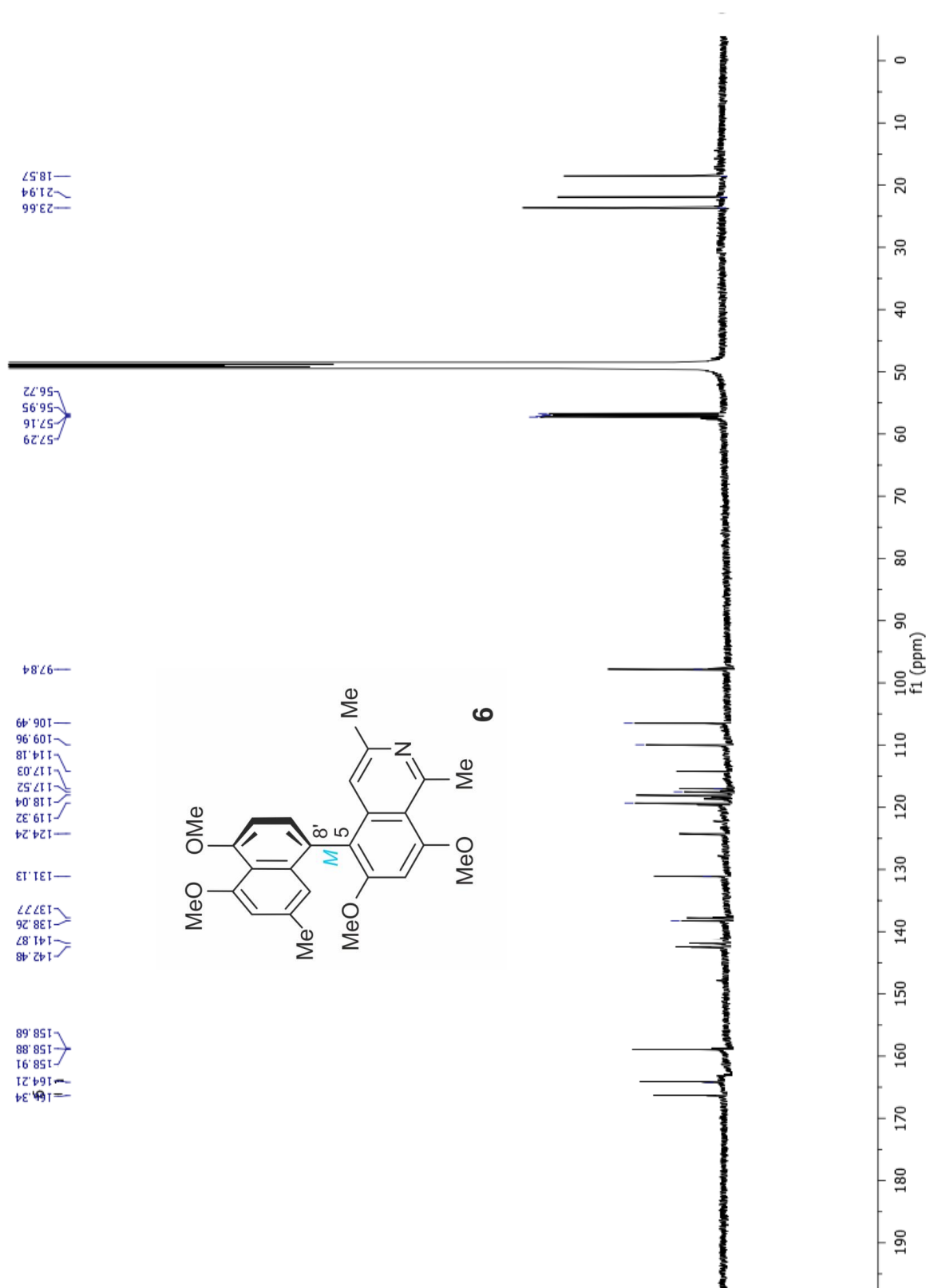


Figure S42. ^{13}C NMR spectrum of ancistrobreveine D (6).

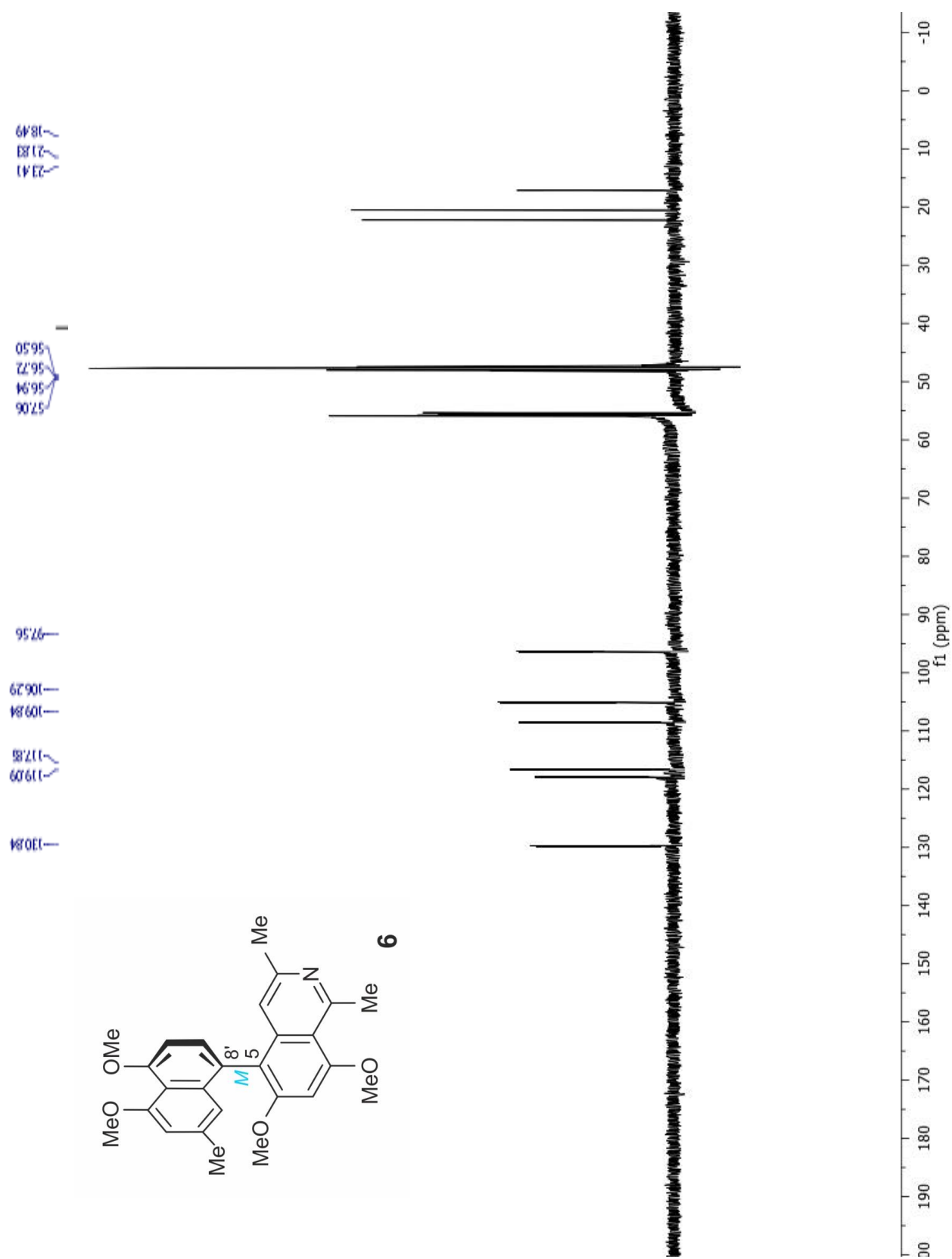


Figure S43. ¹³C DEPT-135 spectrum of ancistobreveine D (6).

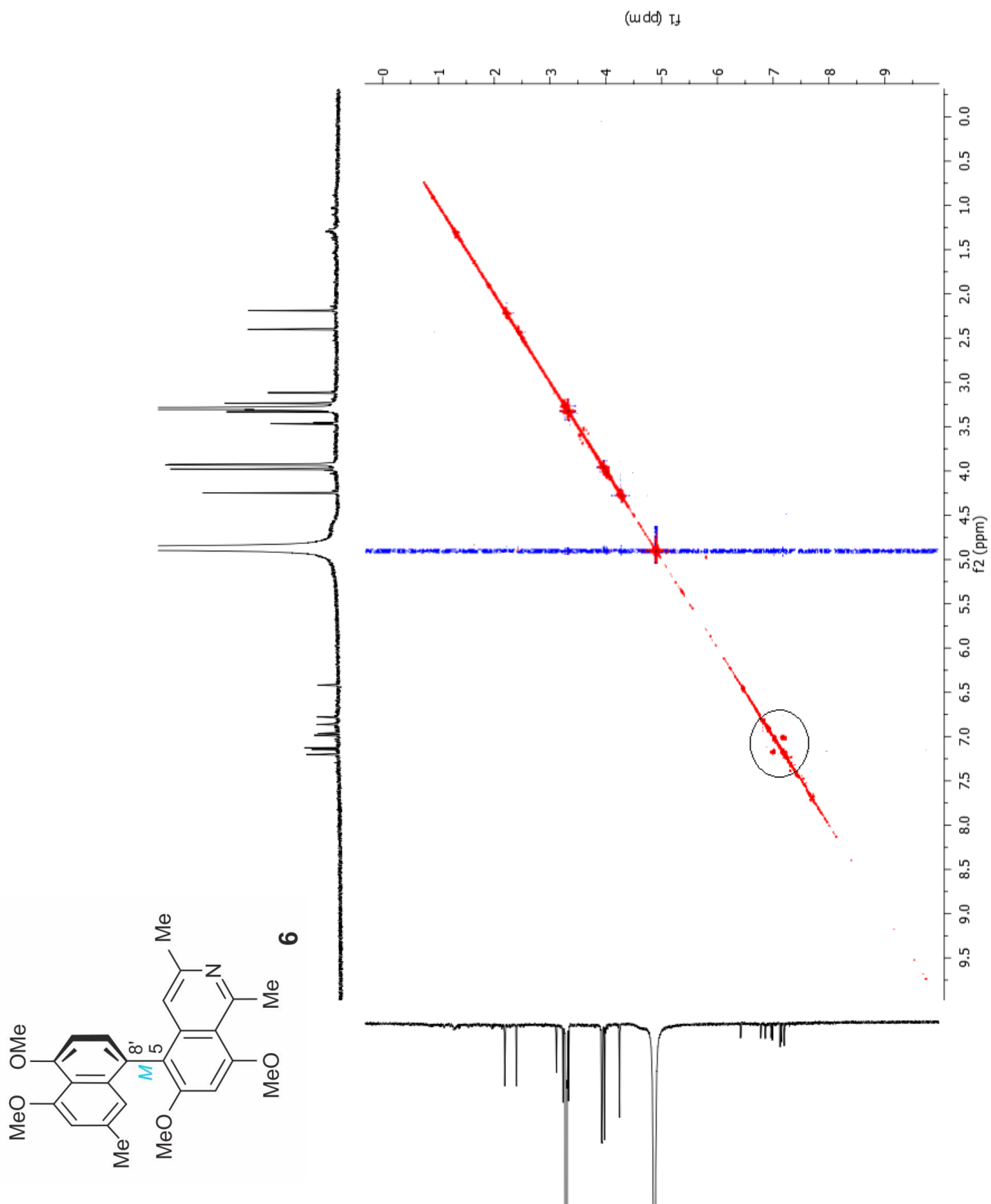


Figure S44. COSY spectrum of ancistrobreveine D (6).

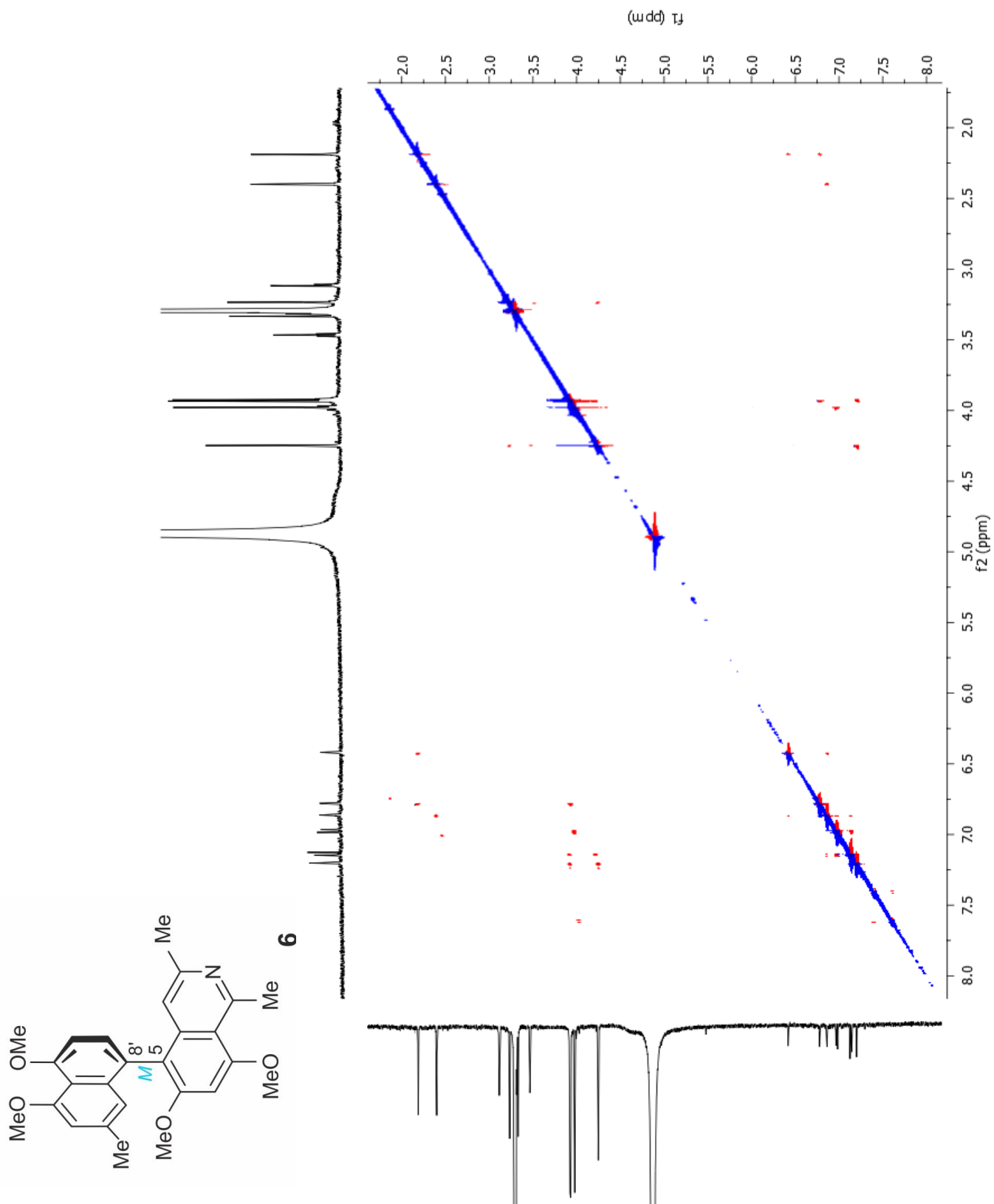


Figure S45. ^1H - ^1H NOESY spectrum of ancistrobreveine D (**6**).

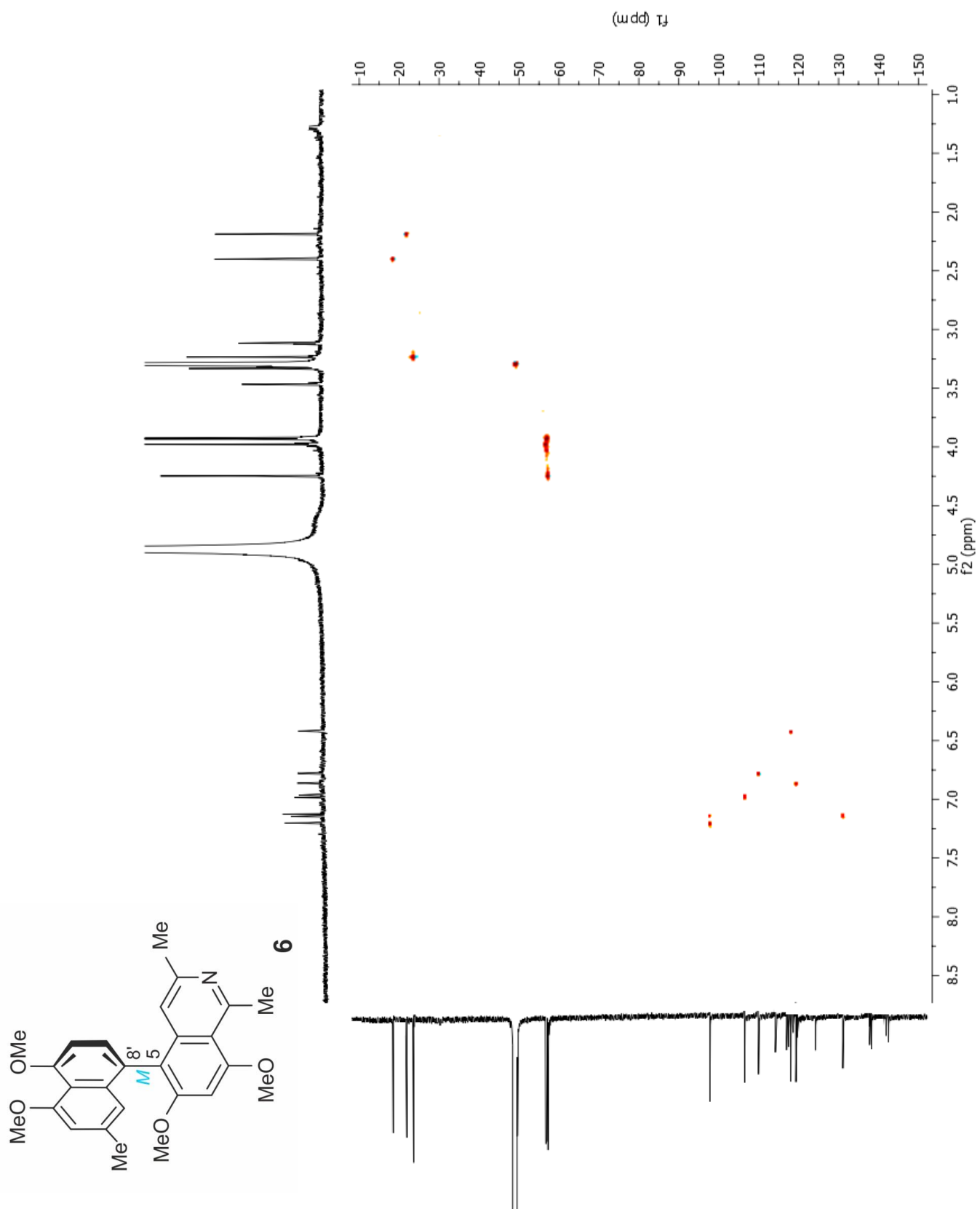


Figure S46. HSQC spectrum of ancistrobrevine D (6).

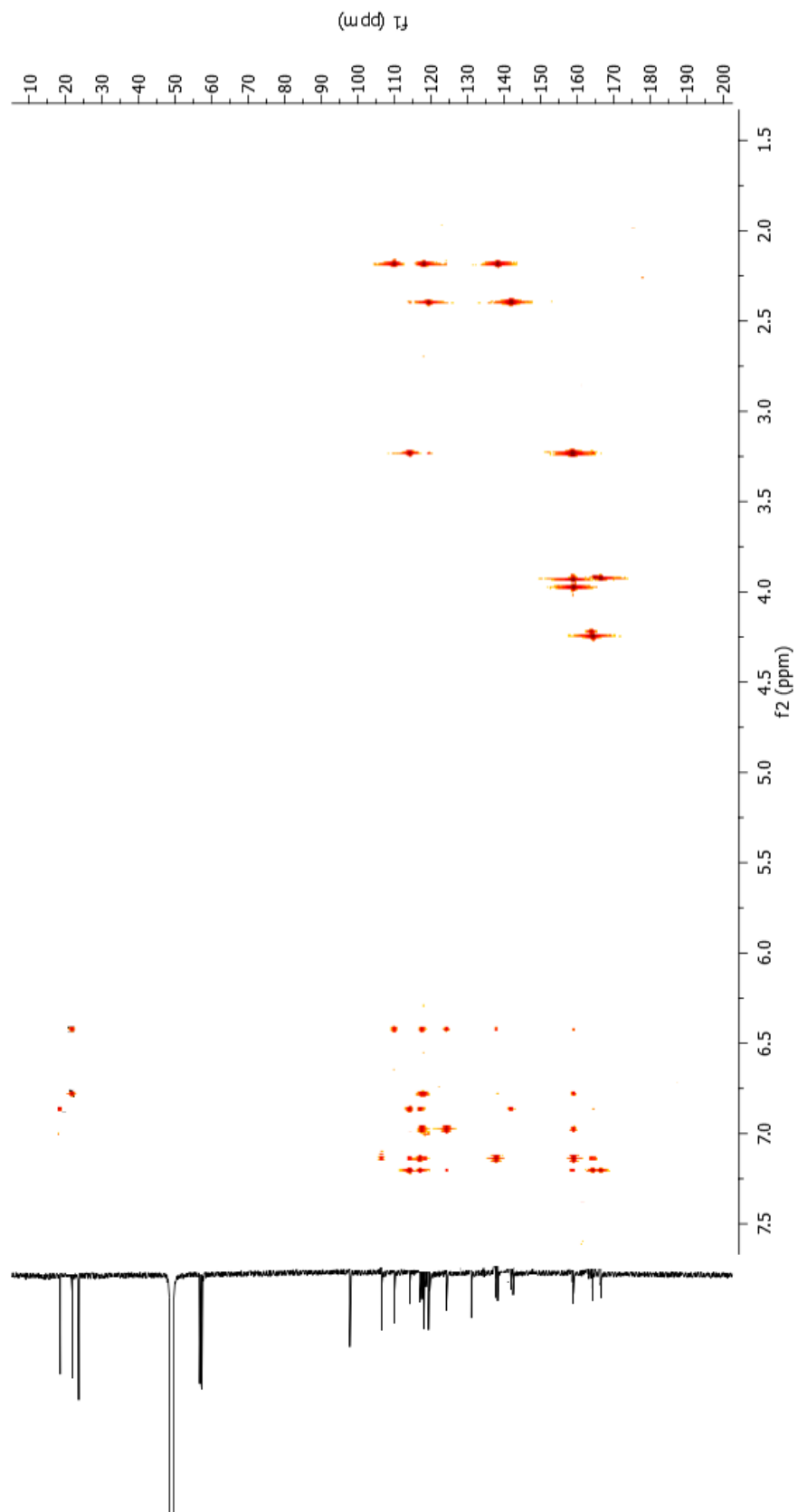
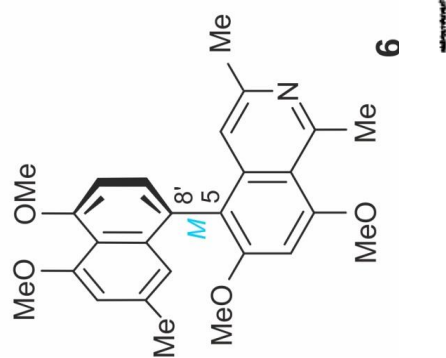


Figure S47. HMBC spectrum of ancistrobreveine D (**6**).

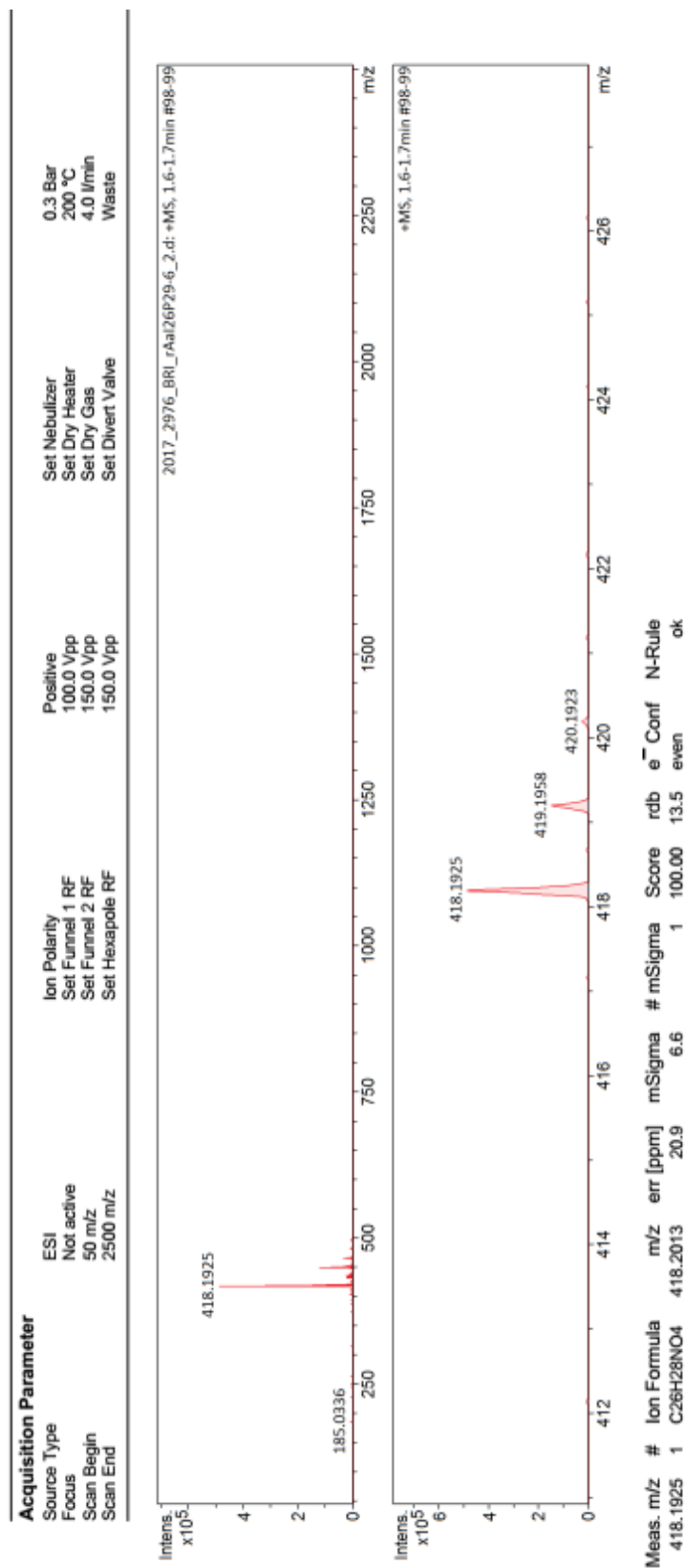
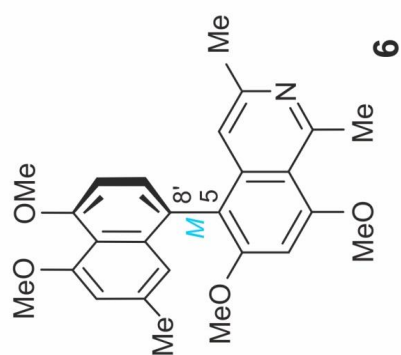
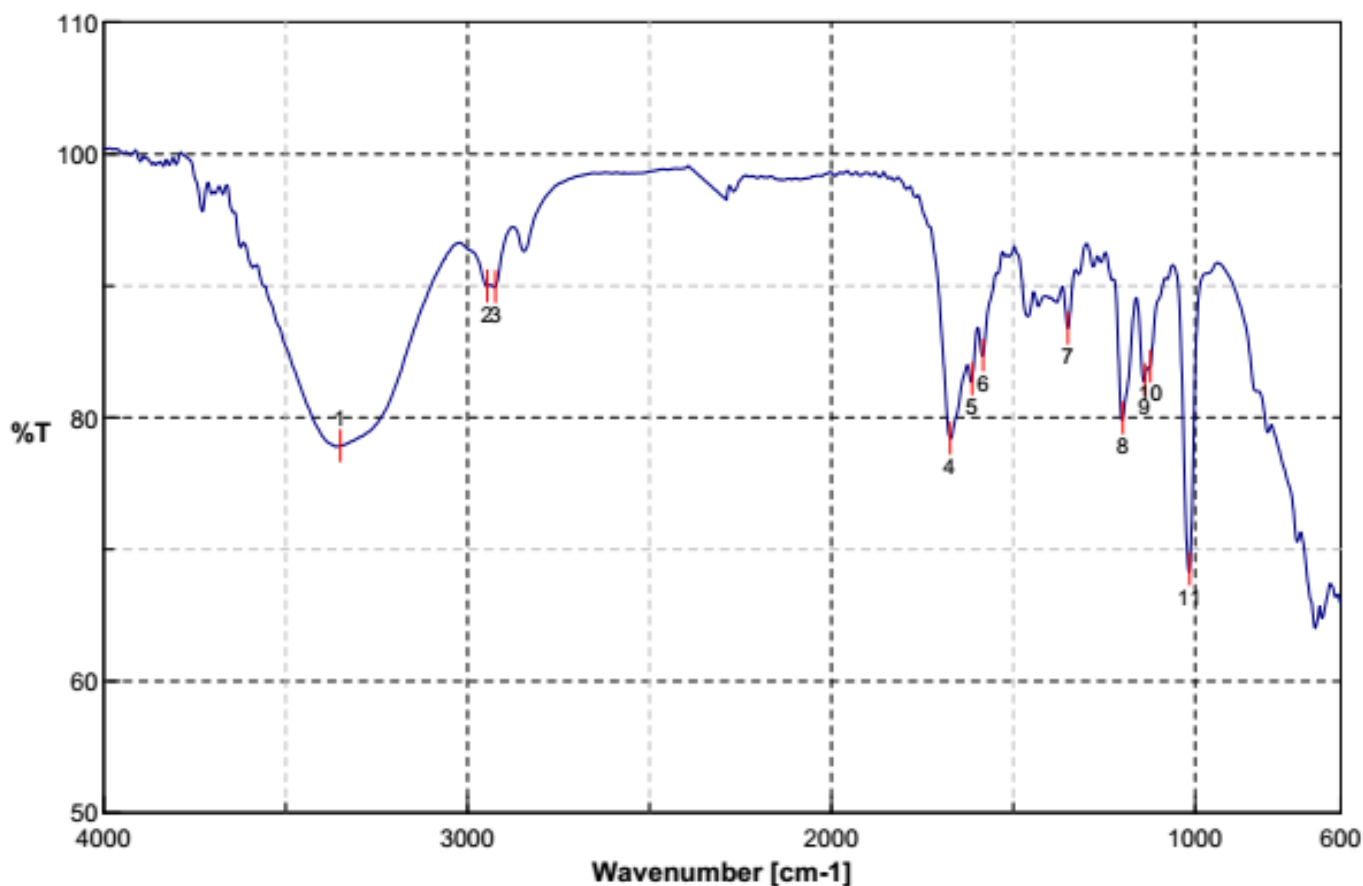
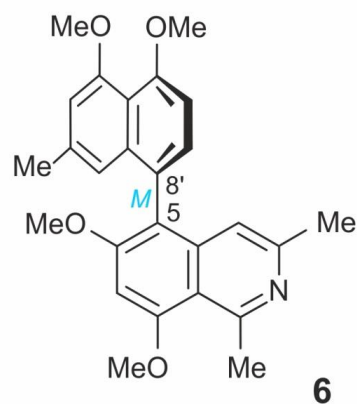


Figure S48. HRESIMS spectrum of ancistrobreveine D (**6**).



Accumulation 8
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 Zero Filling ON
 Apodization Cosine
 Gain Auto (4)
 Scanning Speed Auto (2 mm/sec)
 Date/Time 19.10.2017 17:10
 Update 19.10.2017 18:04
 Operator Student
 File Name Memory#1
 Sample Name
 Comment



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7	1349.93	86.7885	8	1198.54	79.9906	9	1138.76	82.9035
10	1123.33	83.9113	11	1015.34	68.5075			

Figure S49. IR spectrum ancistrobreveine D (6).

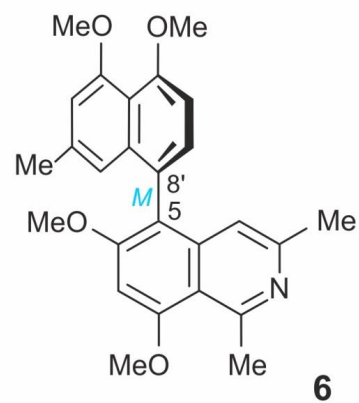
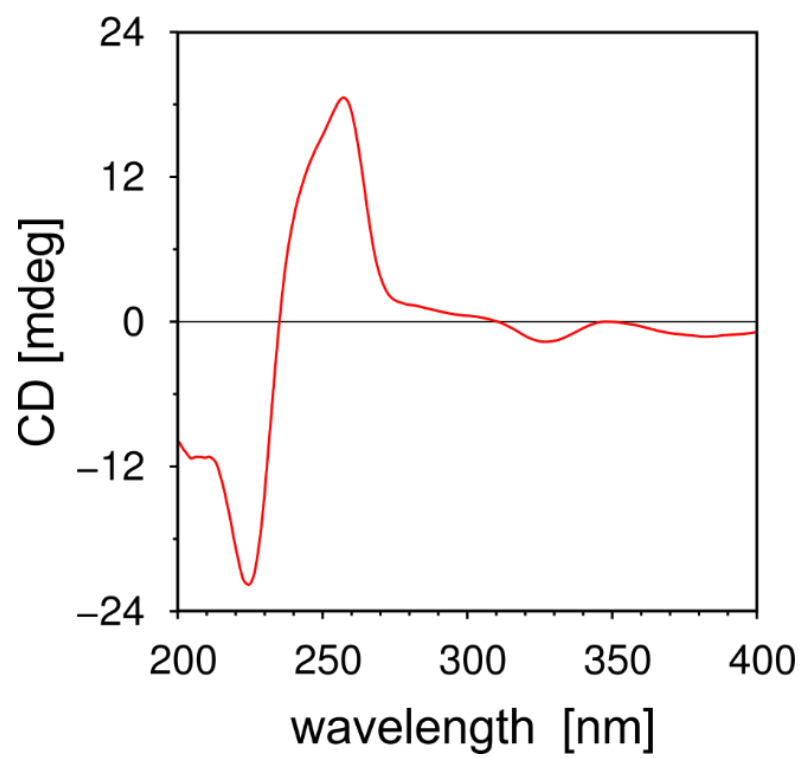


Figure S50. ECD spectrum of ancistrobreveine D (**6**).

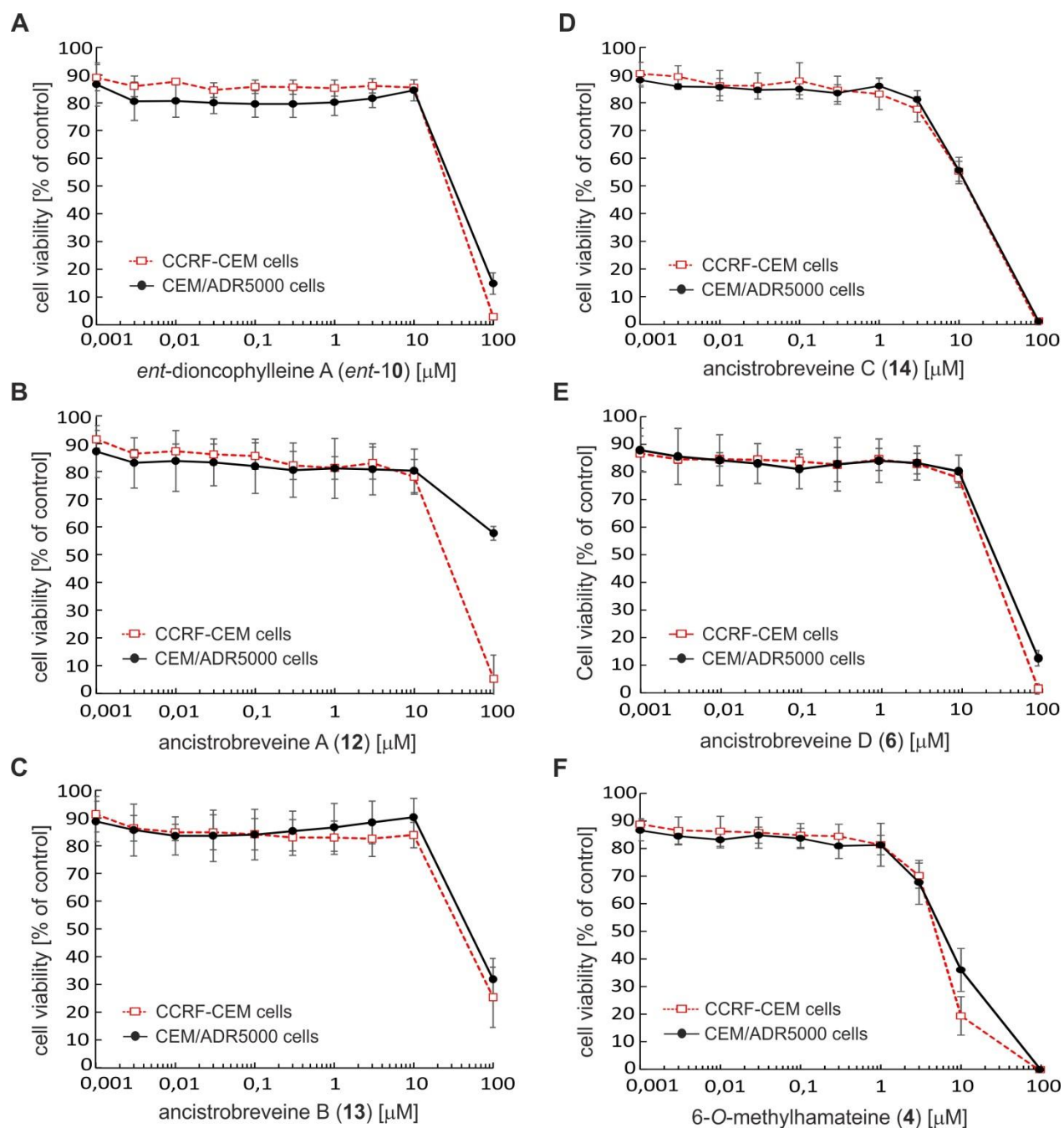


Figure S51 (A-F). Cytotoxic activities of *ent*-dioncophylleine A (*ent*-10), the ancistrobreveines A (12), B (13), C (14), and D (6), and 6-O-methylhamateine (4) towards parental drug-sensitive CCRF-CEM leukemia cells and their multidrug resistant subline, CEM/ADR5000. Compounds *ent*-10, 12-14, 6, and 4 were dissolved in DMSO (< 1%) and cell culture medium at concentrations of 0.001, 0.003, 0.01, 0.03, 0.12, 0.3, 1, 3, 10, and 50 μM . Cell viability was assessed by the resazurin assay. Mean values and standard deviation of three independent experiments with each six parallel measurements are shown.