Supporting Information

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Alkaloids of *Papaver libanoticum* and their Cytotoxic Activity

Mohamad Ali Hijazi[1]*, Maha Aboul-Ela[1], Kamal Bouhadir[2], Maamoun Fatfat[3], Hala Gali-Muhtasib[3,4] and Abdalla Ellakany[1]

[1]Department of Pharmaceutical Sciences, Beirut Arab University, Beirut, Lebanon
[2]Department of Chemistry, American University of Beirut, Beirut, Lebanon
[3]Center for Drug Discovery, Faculty of Medicine, American University of Beirut, Beirut, Lebanon
[4]Department of Biology, American University of Beirut, Beirut, Lebanon

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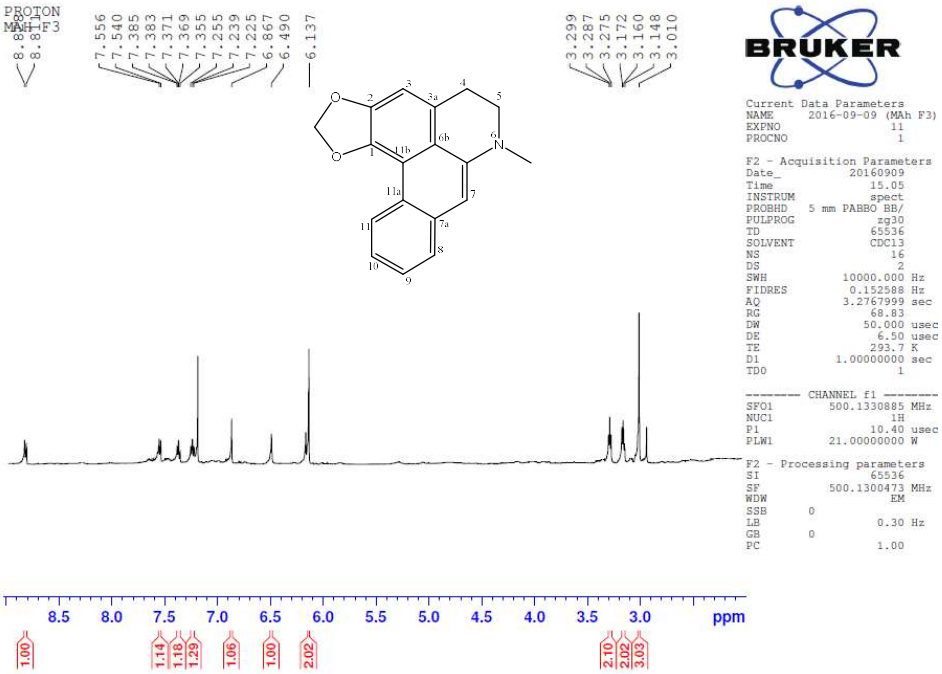
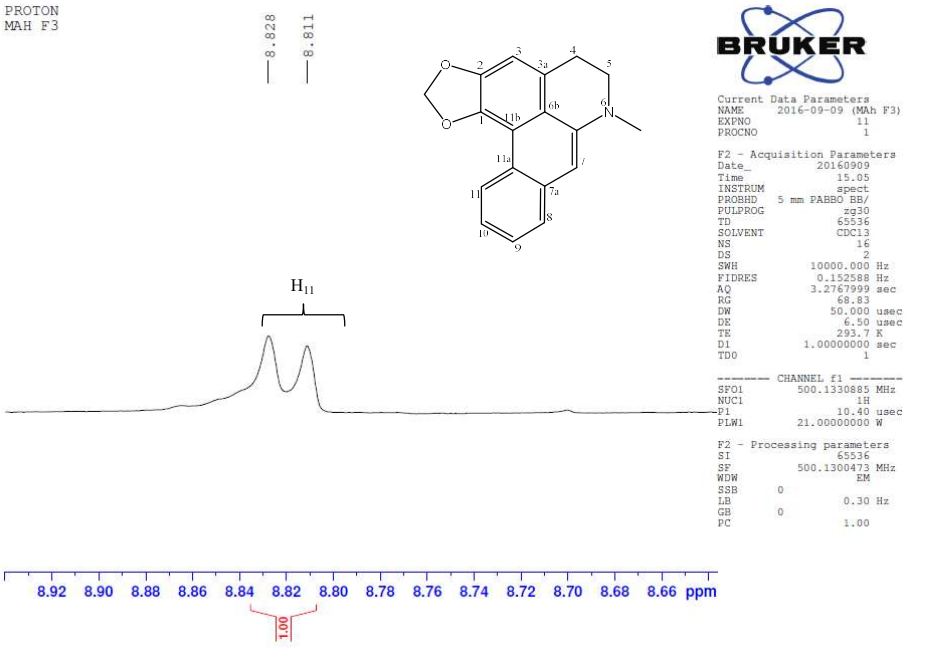
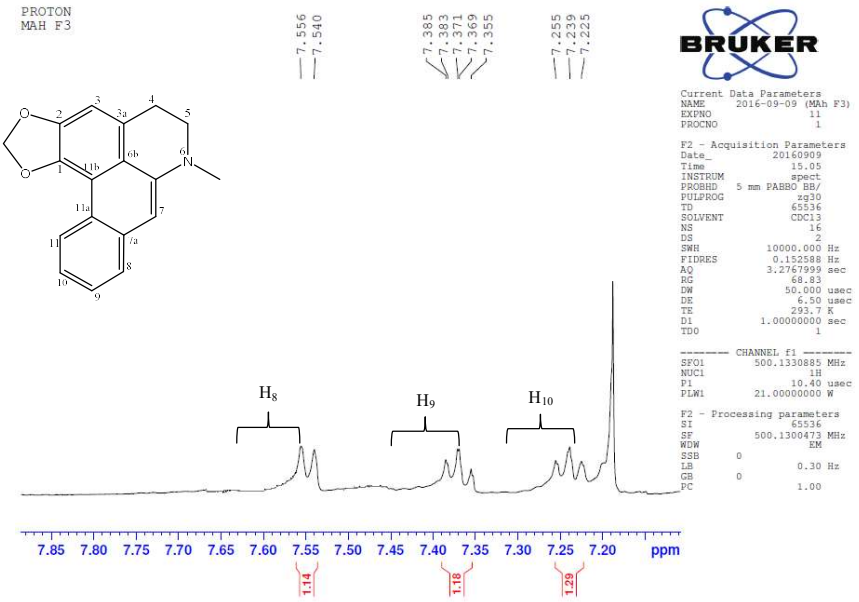


S1: ^{1}H-NMR (500 MHz, $CDCl_3$) Spectrum of Compound **1** (dehydroremerine)



S2: Expansion of the ^{1}H-NMR (500 MHz, $CDCl_3$) Spectrum of Compound **1** (dehydroremerine)



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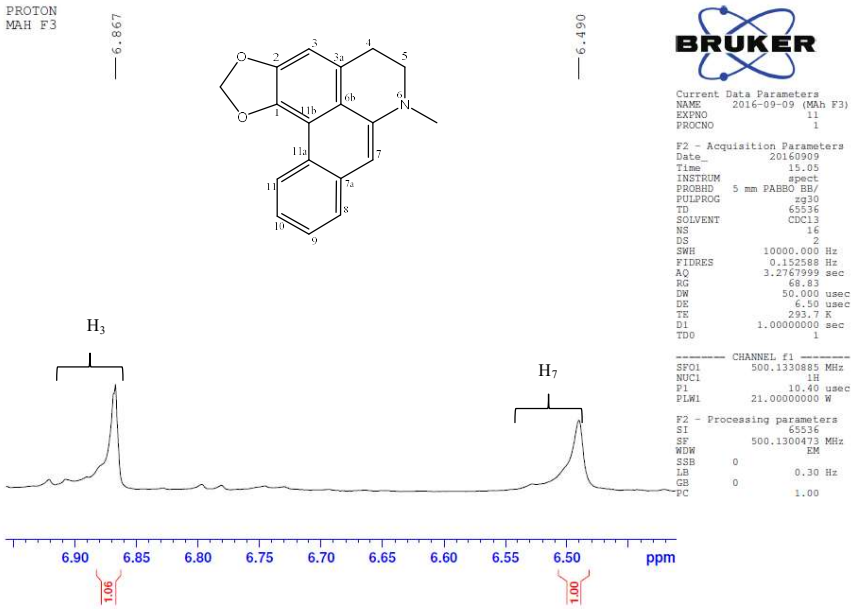

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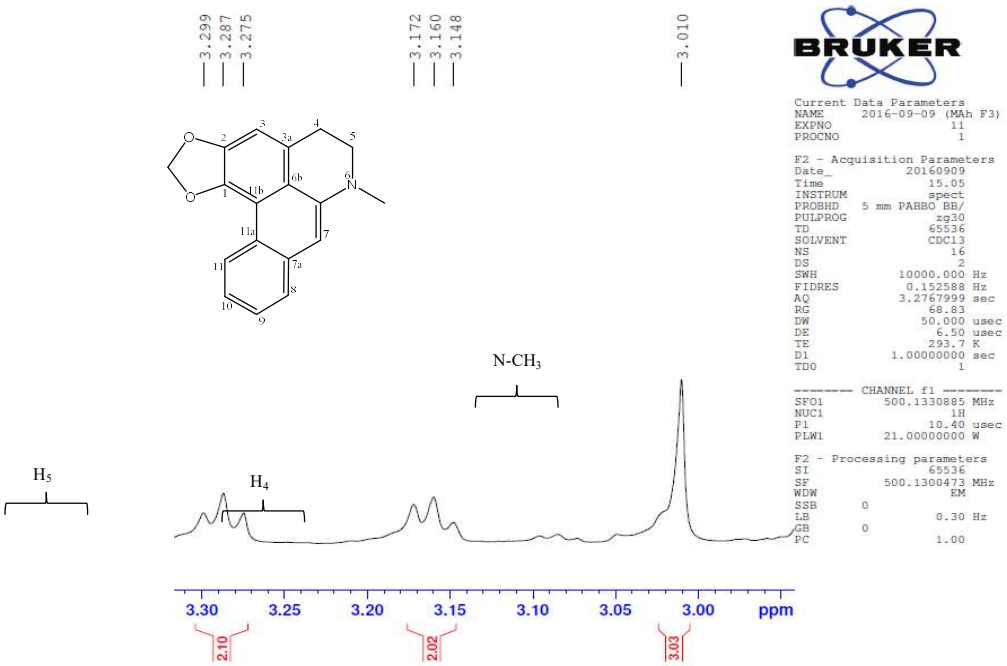
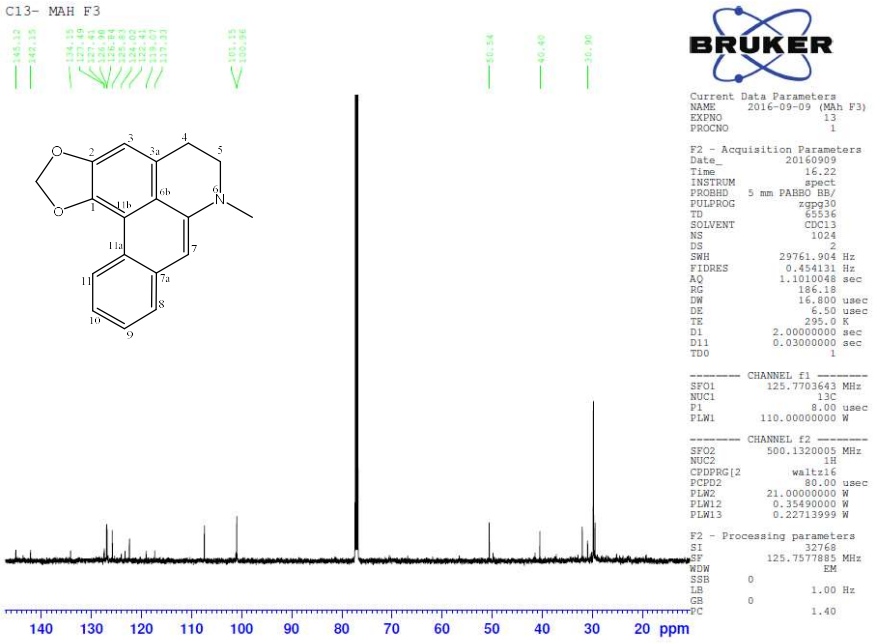
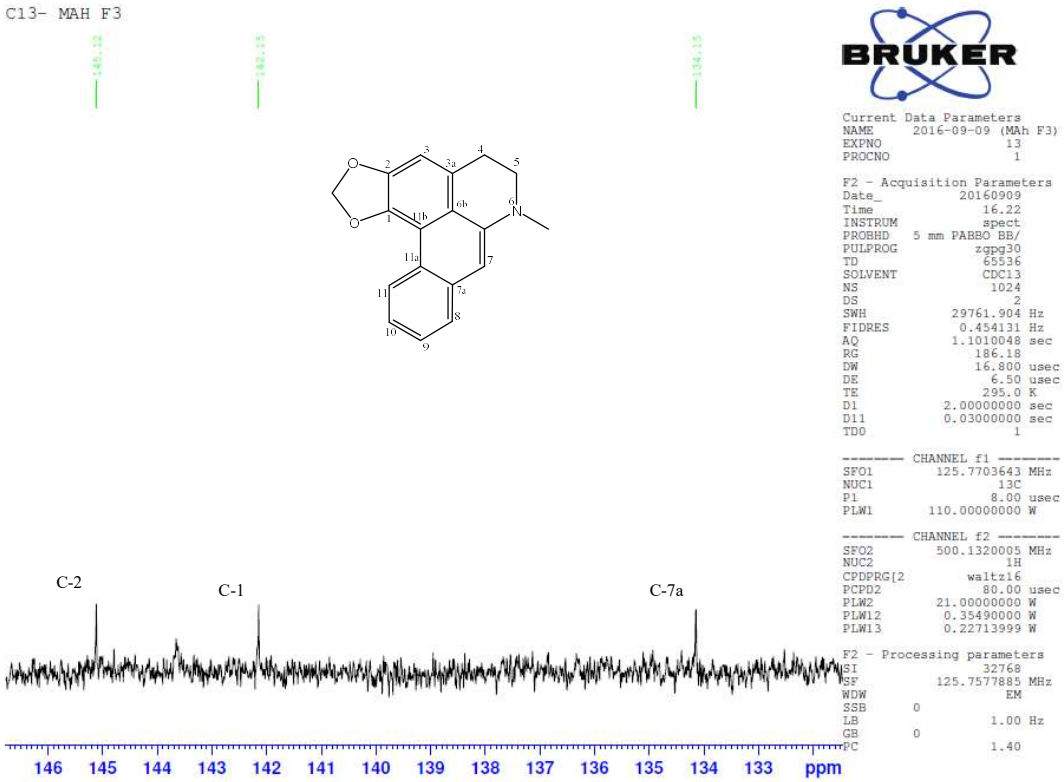


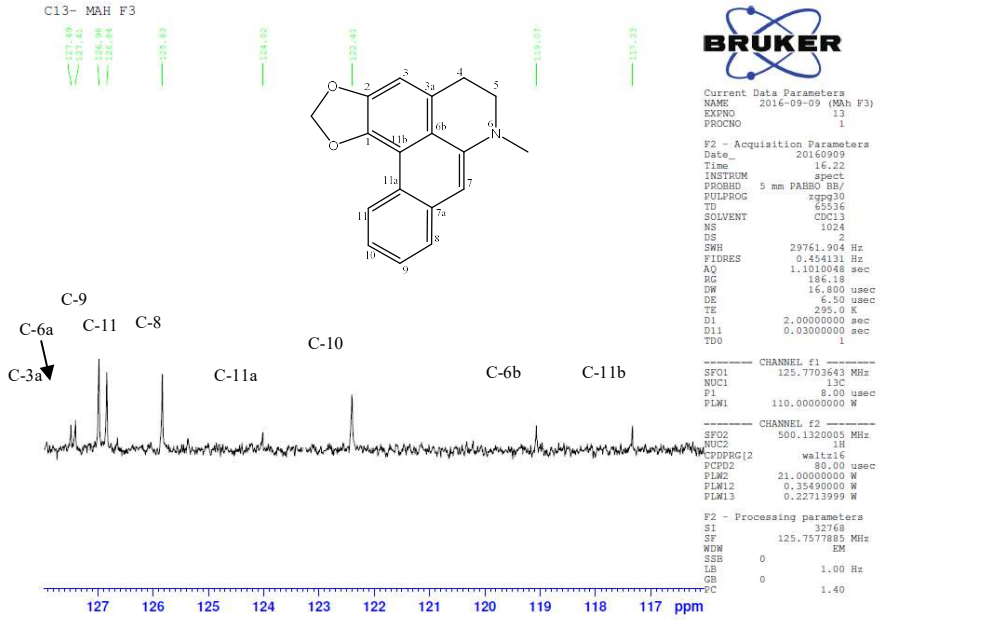
S5: Expansion of the ^{1}H-NMR (500 MHz, $CDCl_3$) Spectrum of Compound **1** (dehydroremerine)



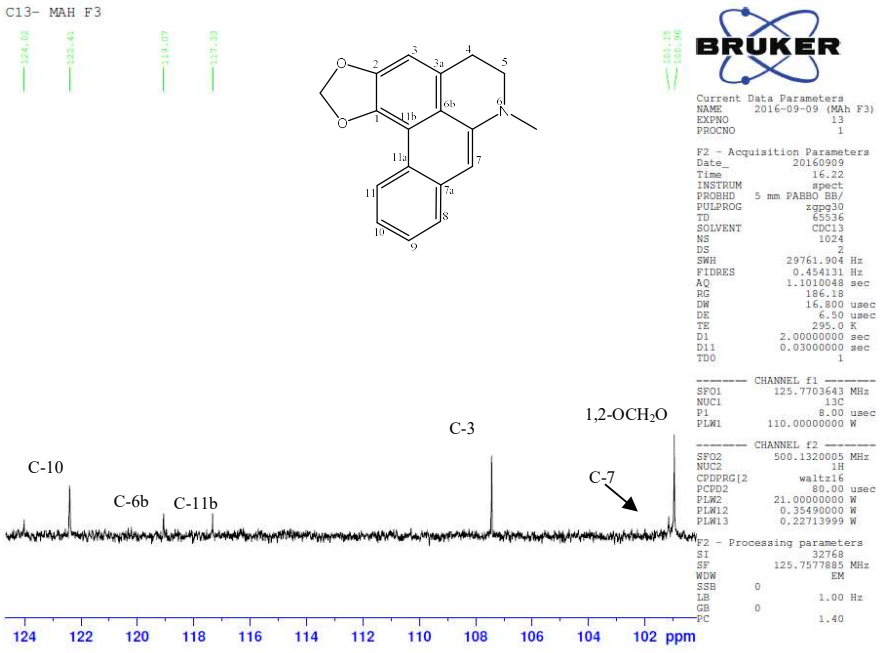
S6: ^{13}C -NMR (500 MHz) Spectrum of Compound **1** (dehydrremerine)



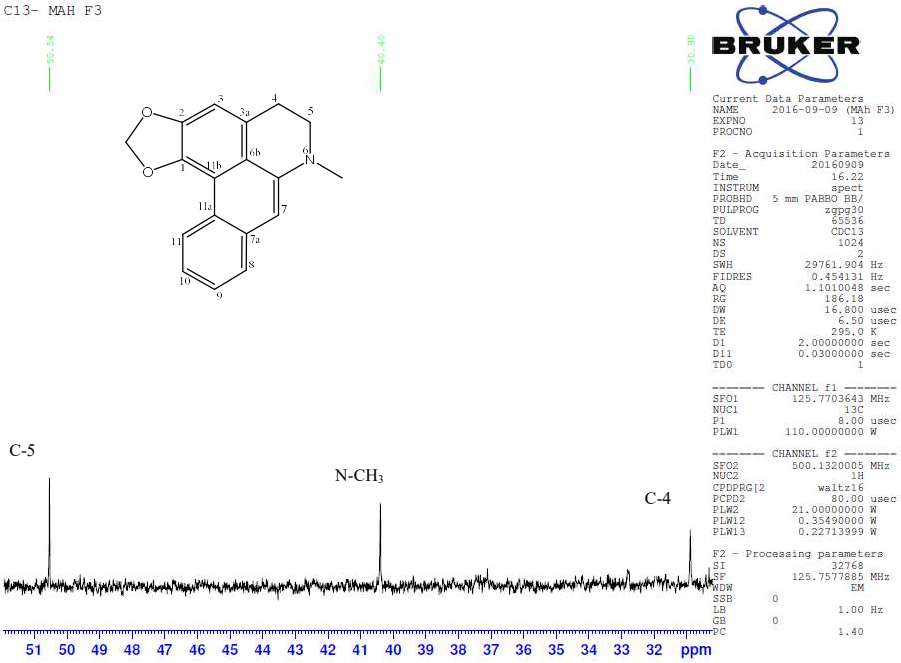
S7: Expansion of the ^{13}C-NMR (500 MHz) Spectrum of Compound **1 (**dehydrremerine)



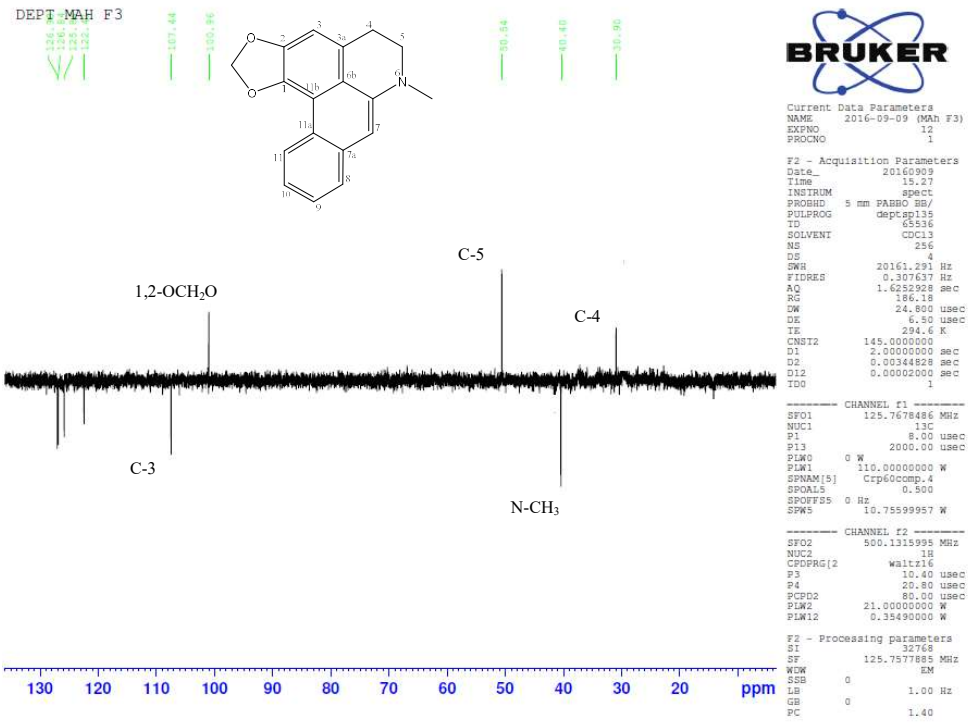
S8: Expansion of the ^{13}C-NMR (500 MHz) Spectrum of Compound **1 (**dehydrremerine)



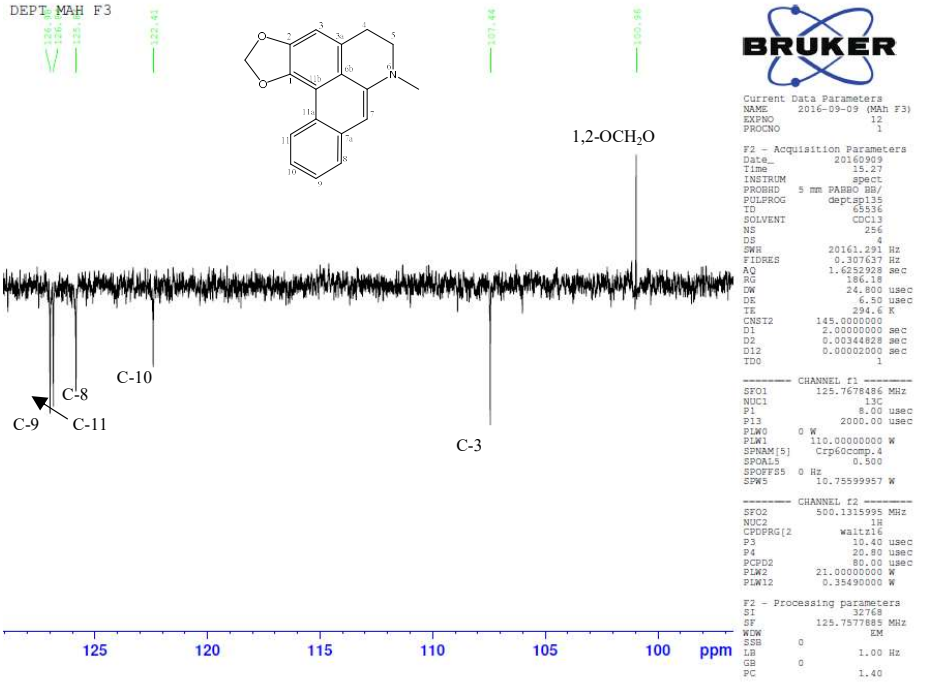
S9: Expansion of the ^{13}C-NMR (500 MHz) Spectrum of Compound **1 (**dehydrremerine)



S10: Expansion of the ^{13}C-NMR (500 MHz) Spectrum of Compound **1 (**dehydrremerine)



S11: DEPT (500 MHz) Spectrum of Compound **1** (dehydroremerine)



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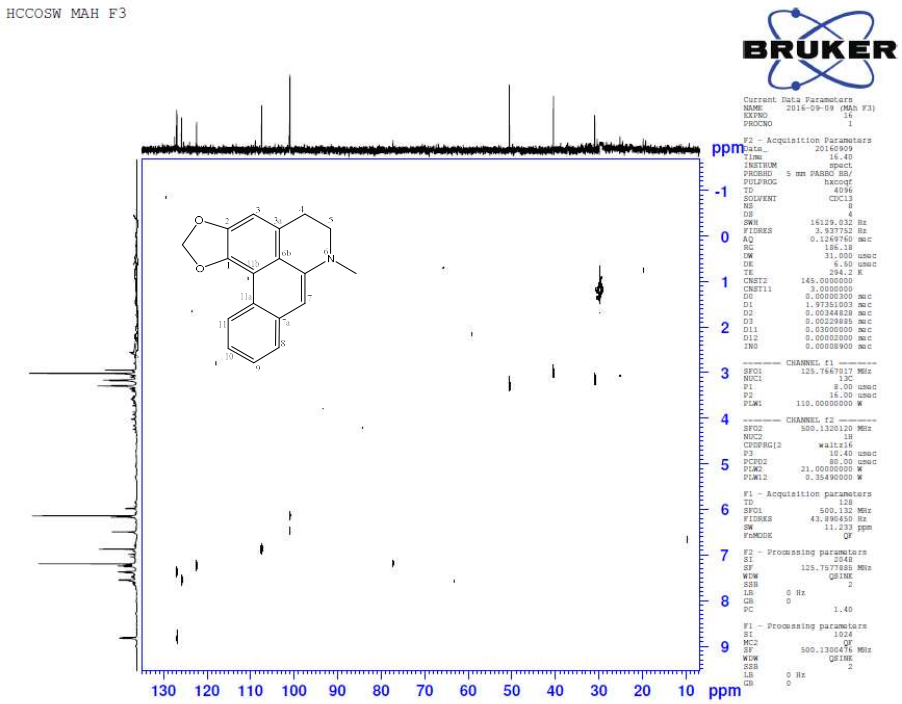
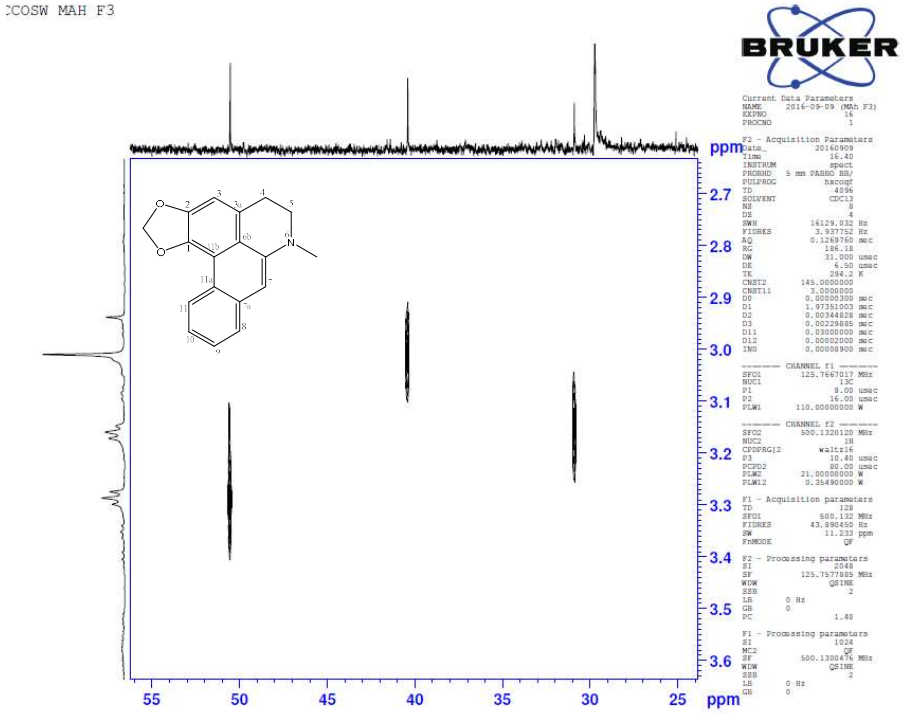


S13: HCCOW Spectrum of Compound **1** (dehydroremerine)



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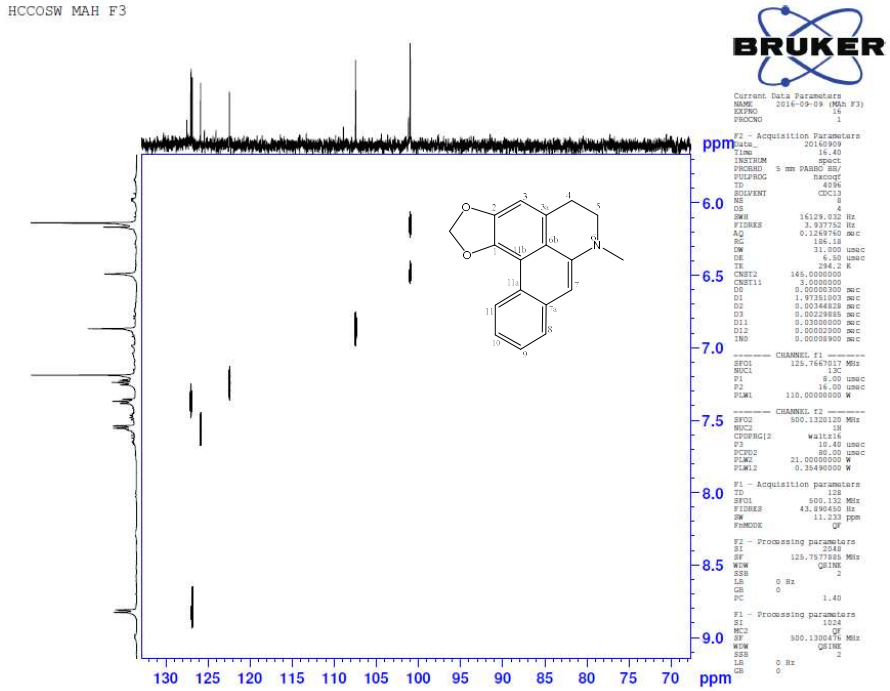

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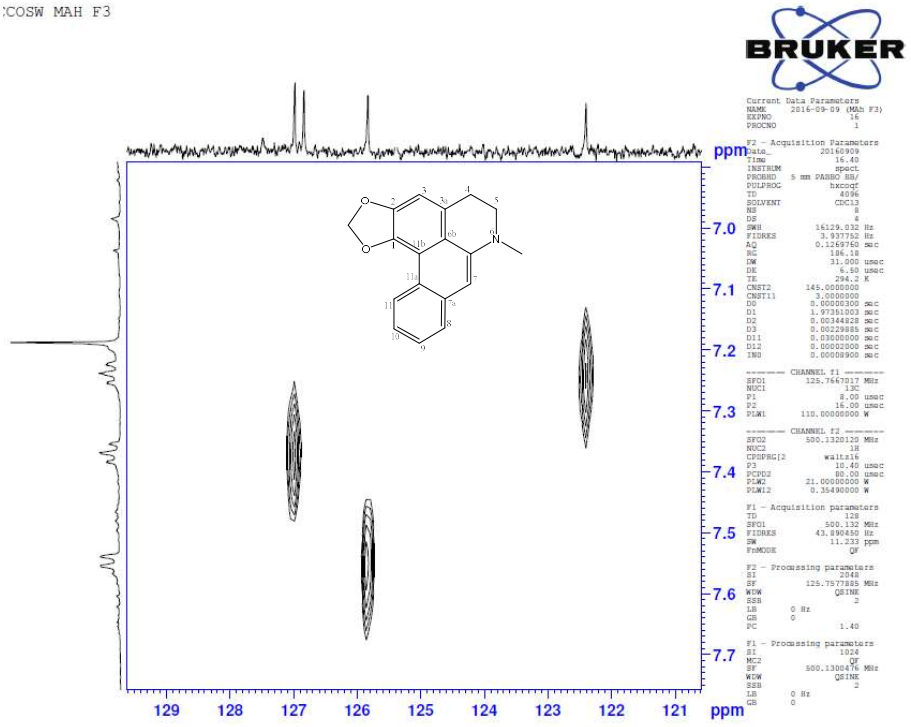

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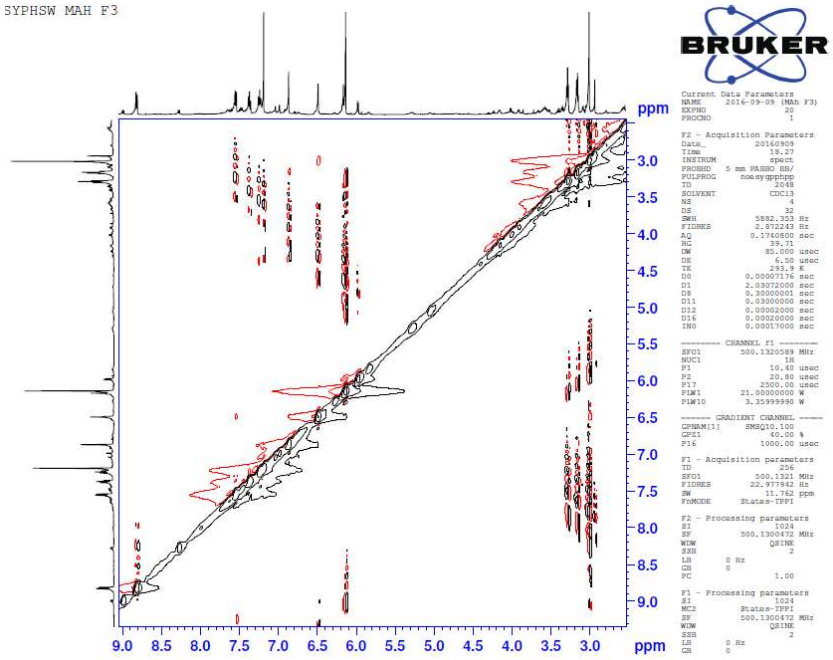
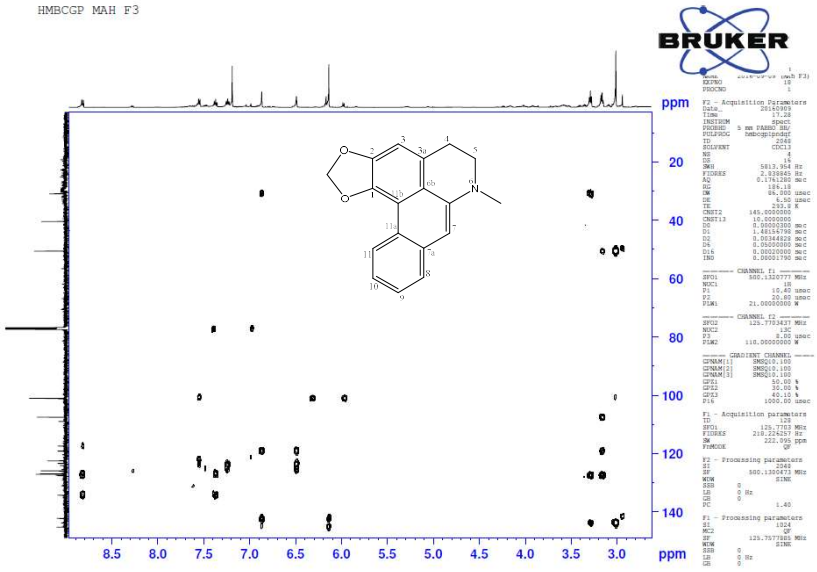
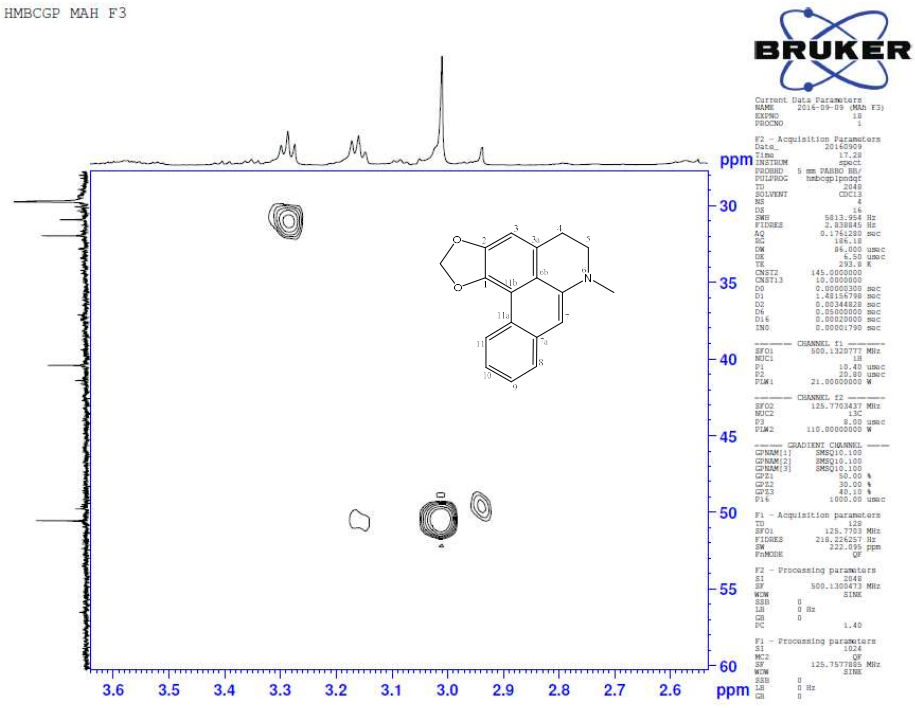


S17: NOSY (500 MHz) Spectrum of Compound **1** (dehydroremerine)



S18: HMBC (500 MHz) Spectrum of Compound **1** (dehydroremerine)



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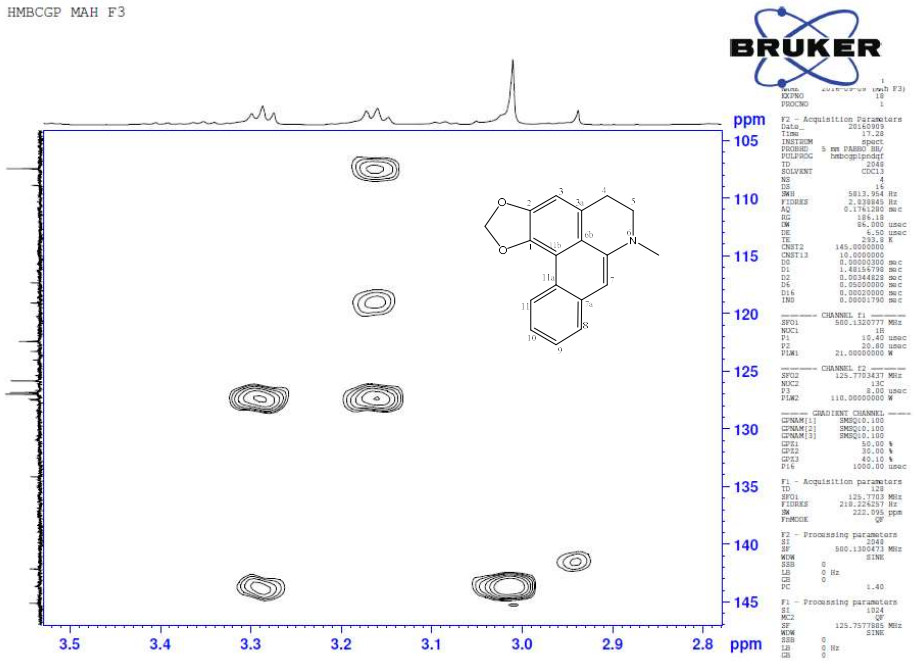
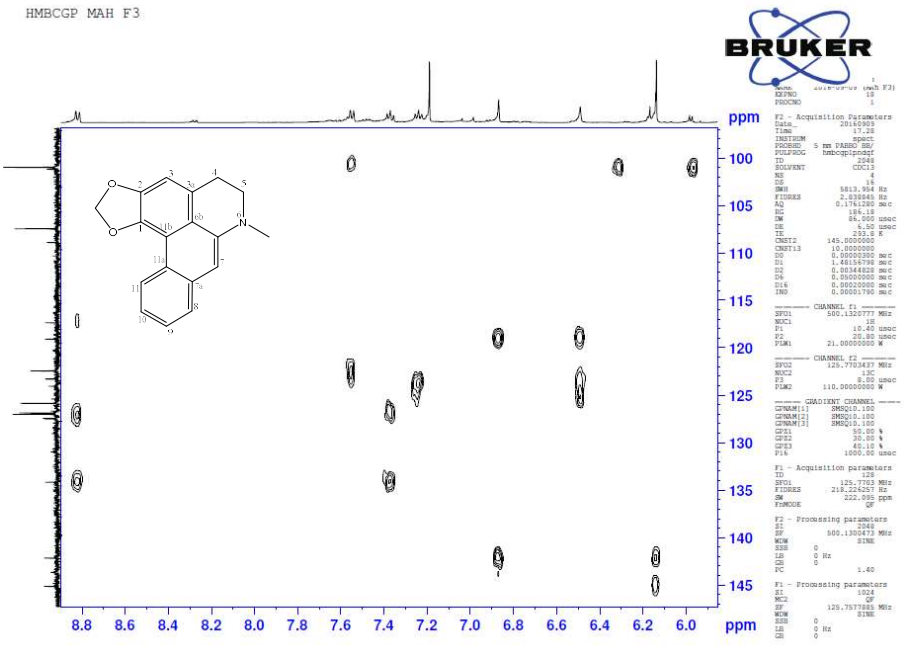
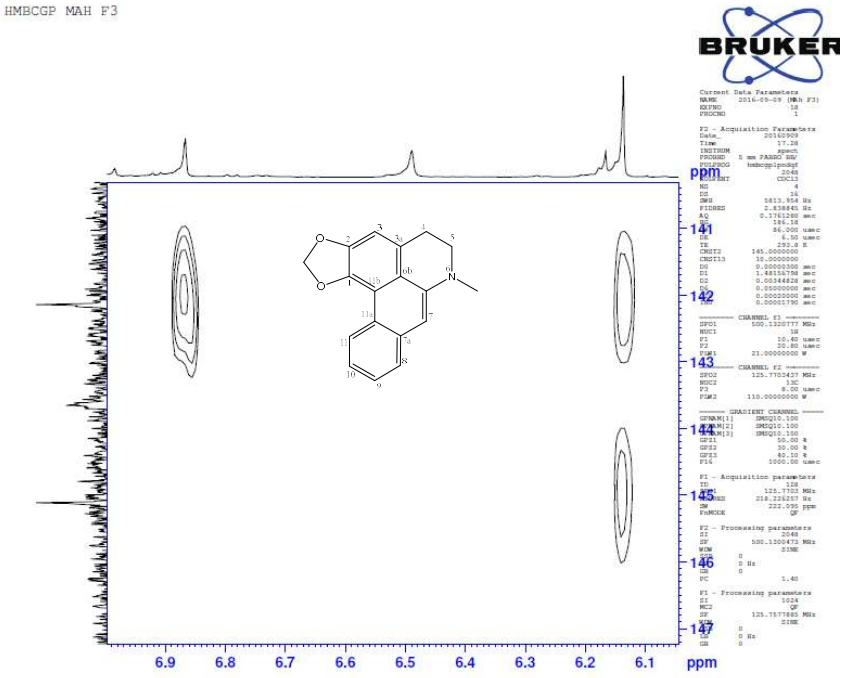


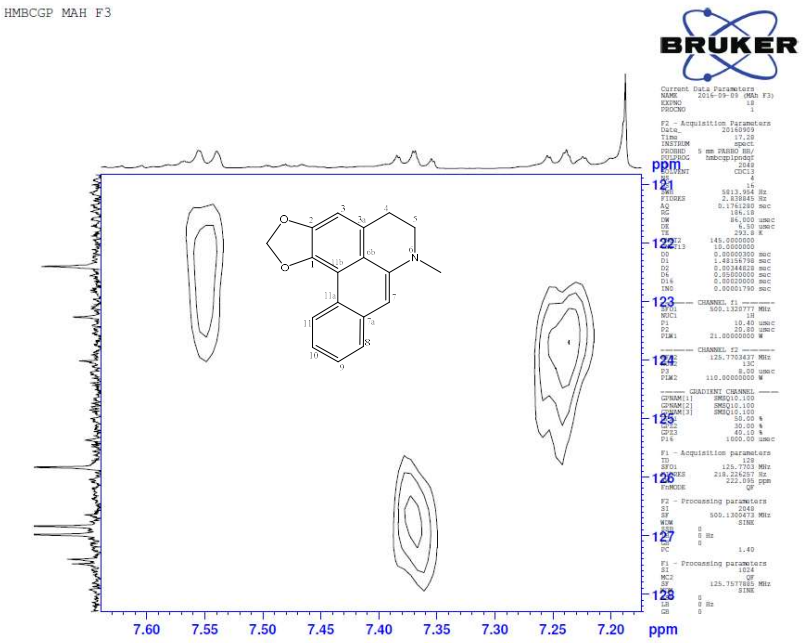
S20: Expansion of the HMBC (500 MHz) Spectrum of Compound **1** (dehydroremerine)



S21: Expansion of the HMBC (500 MHz) Spectrum of Compound **1** (dehydroremerine)



S22: Expansion of the HMBC (500 MHz) Spectrum of Compound **1** (dehydroremerine)



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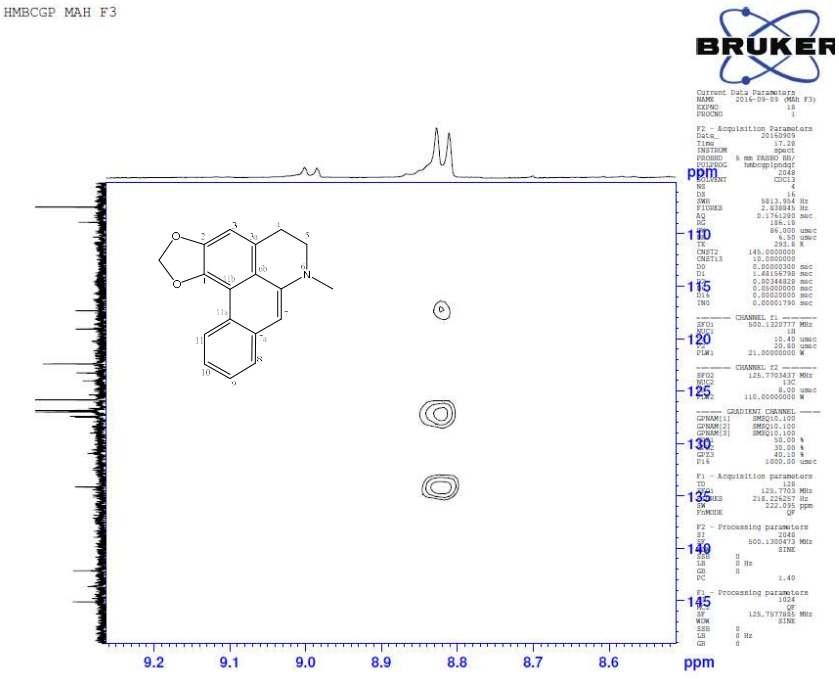
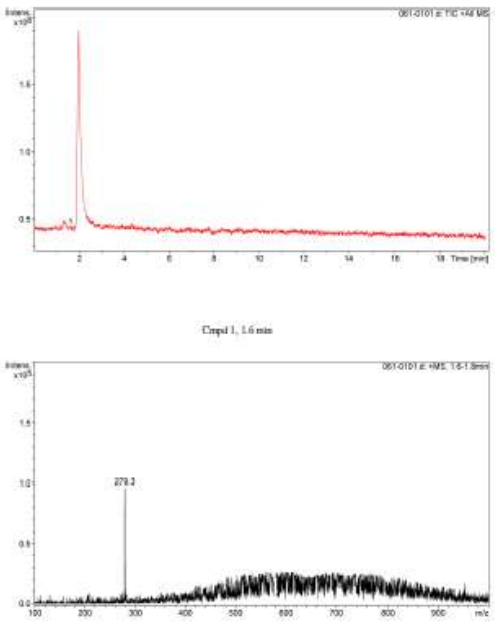
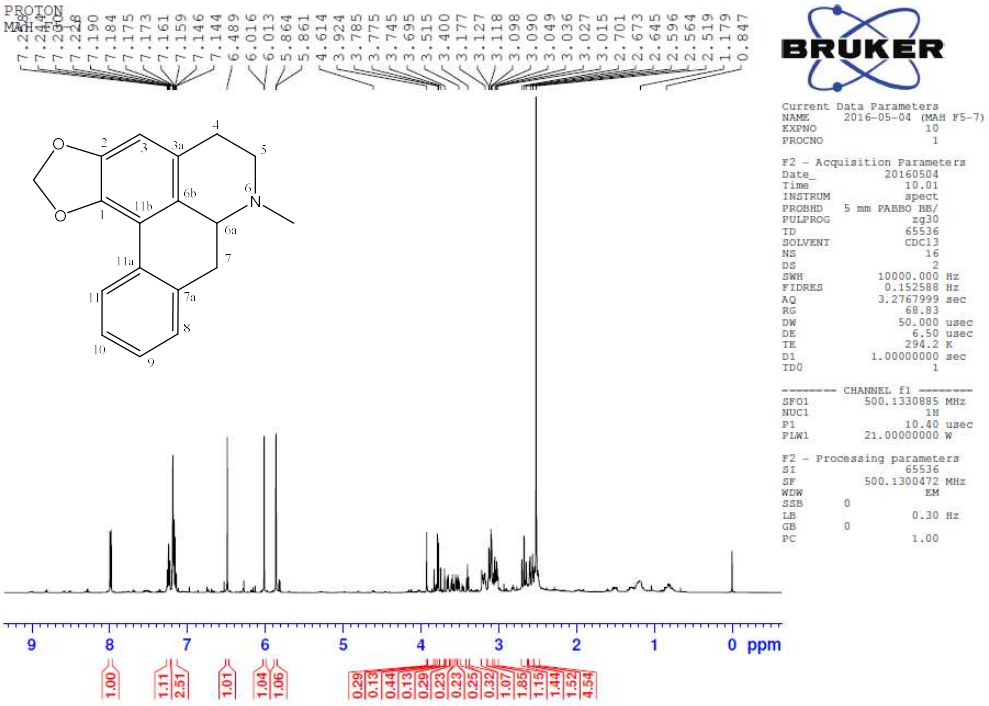


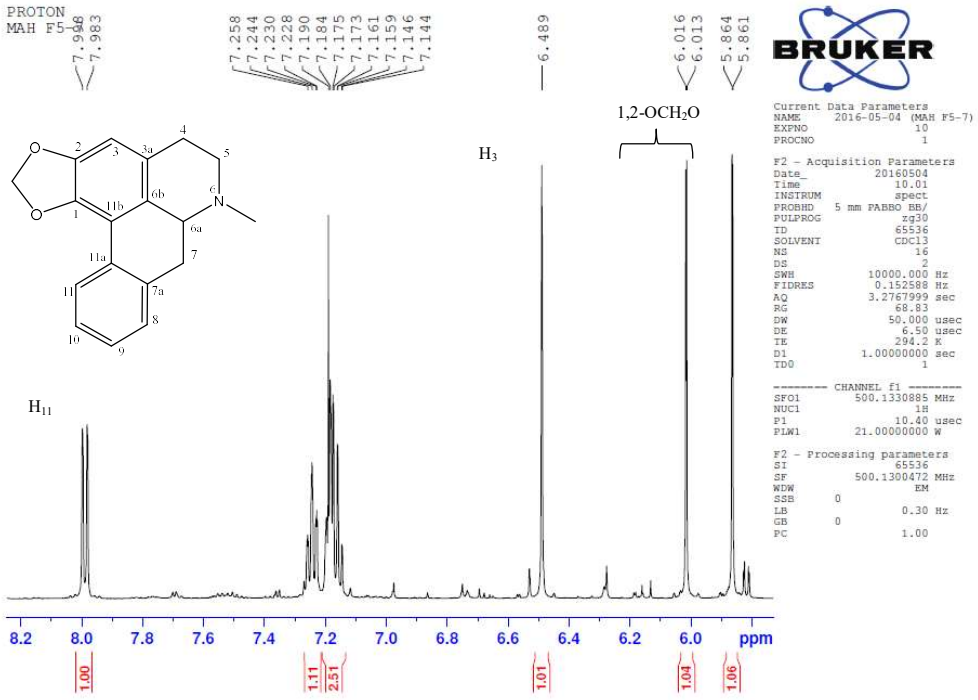
S24: Expansion of the HMBC (500 MHz) Spectrum of Compound **1** (dehydroremerine)



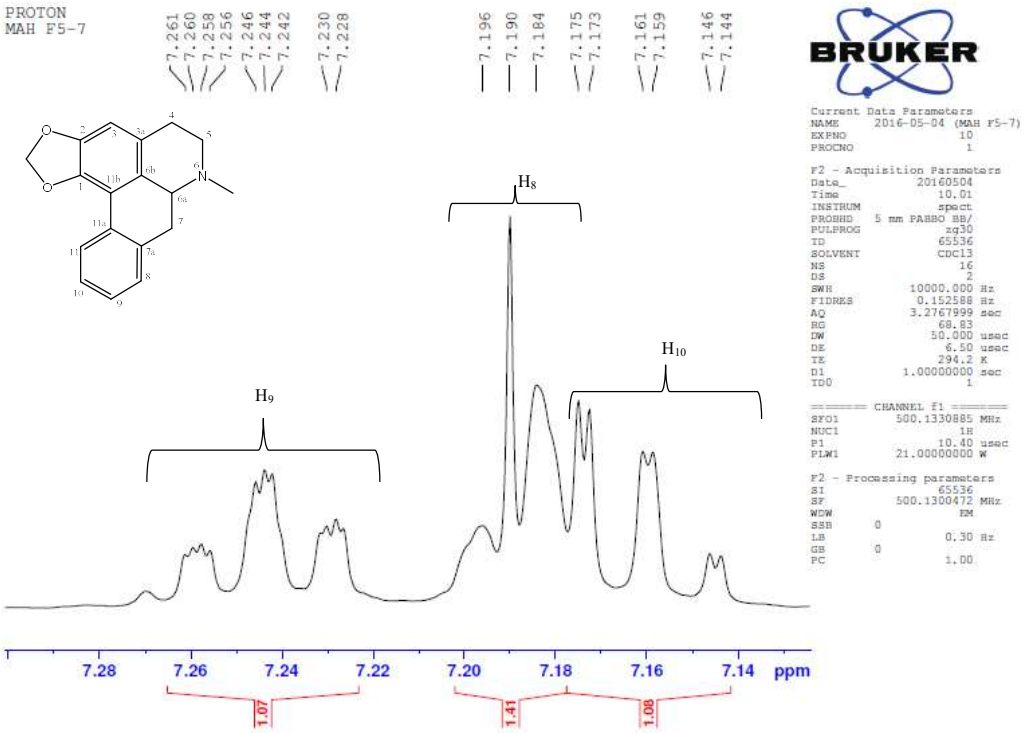
S25: LC-MS Spectrum of Compound **2** (reomerine)



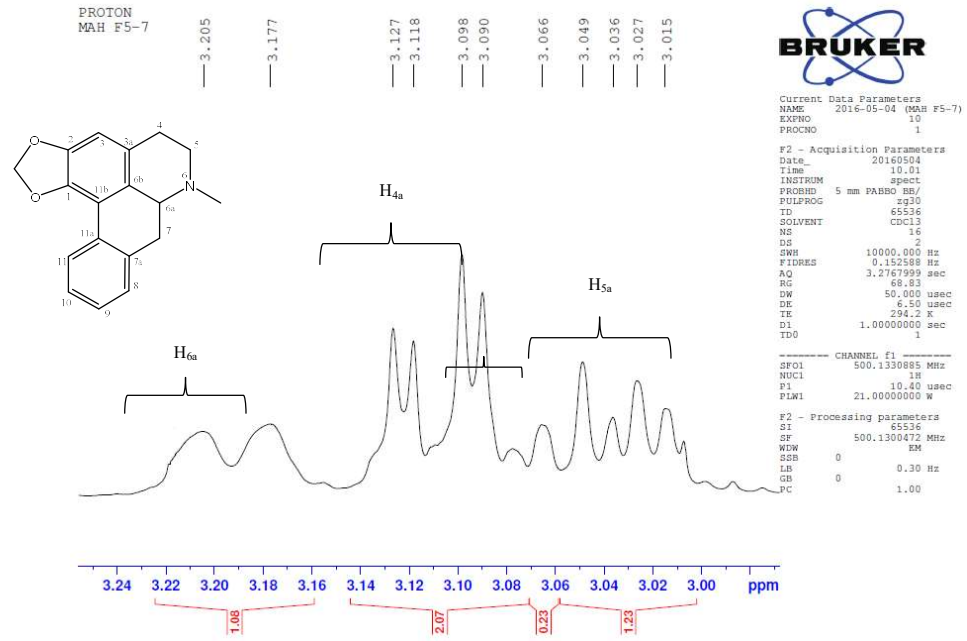
S26: ^{1}H-NMR (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



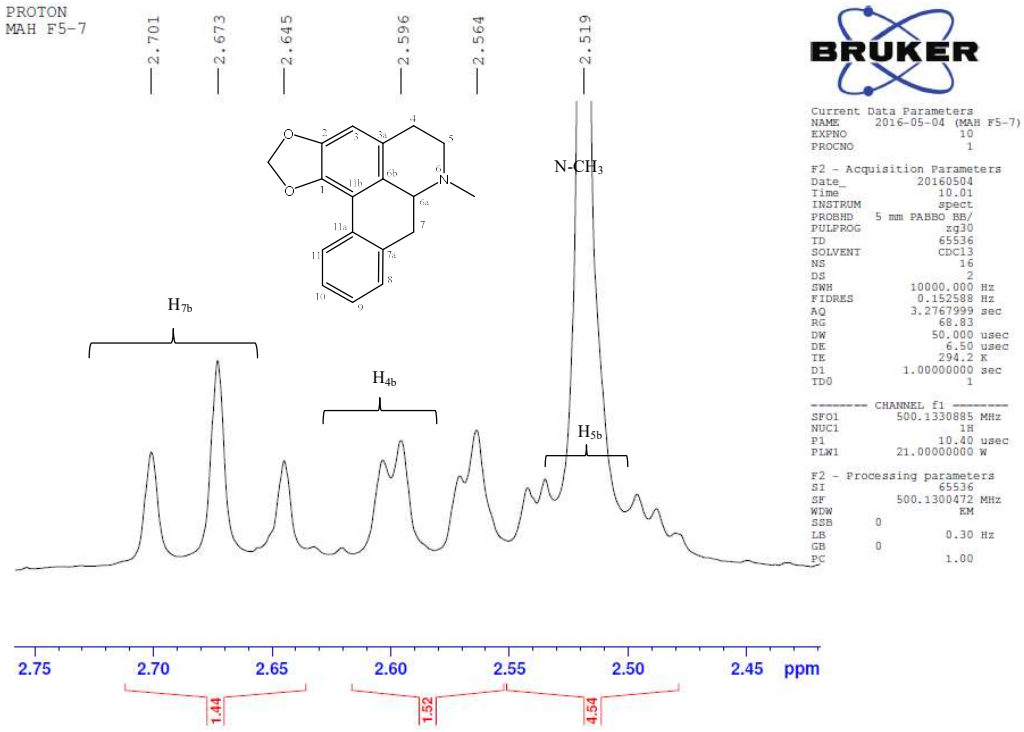
S27: Expansion ^{1}H-NMR (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



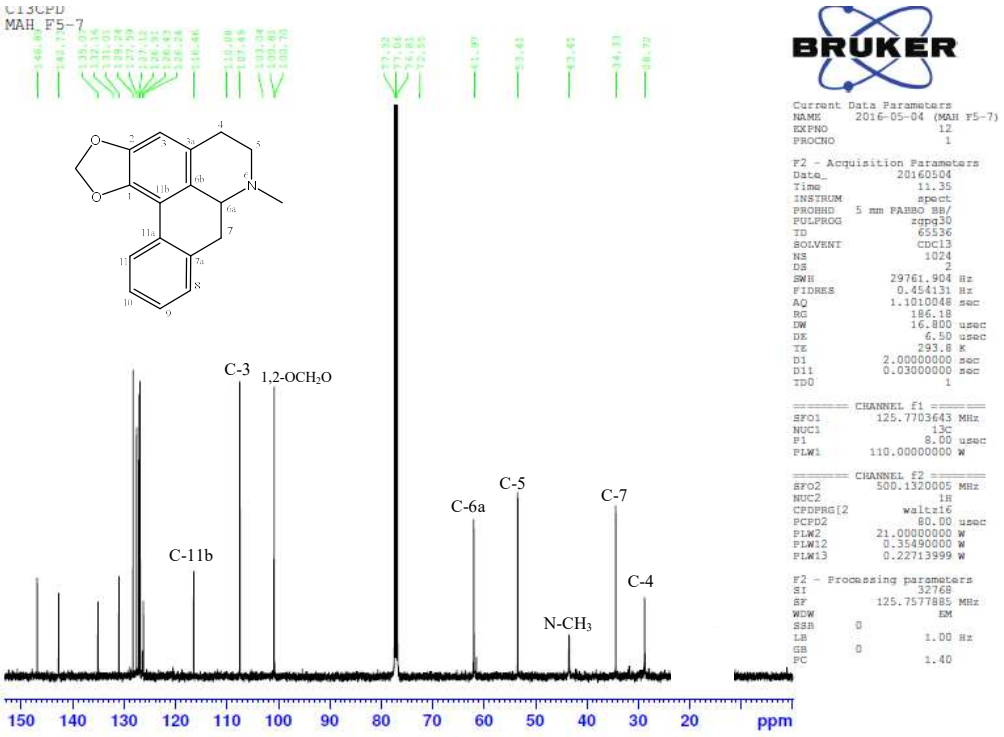
S28: Expansion ^{1}H-NMR (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



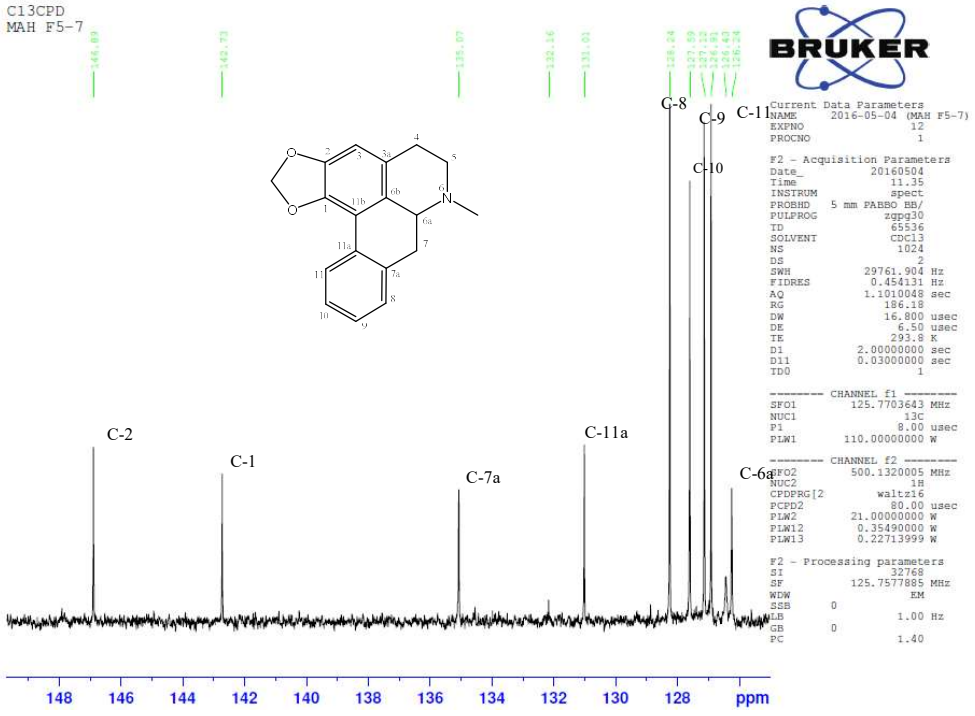
S29: Expansion ^{1}H-NMR (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



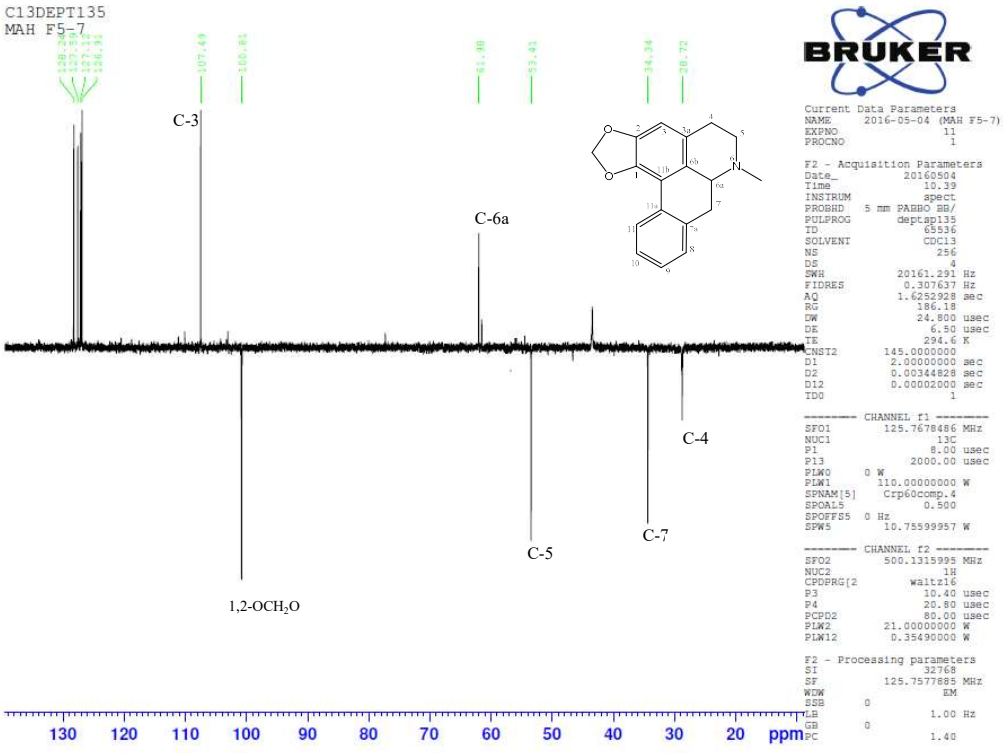
S30: Expansion ^{1}H-NMR (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



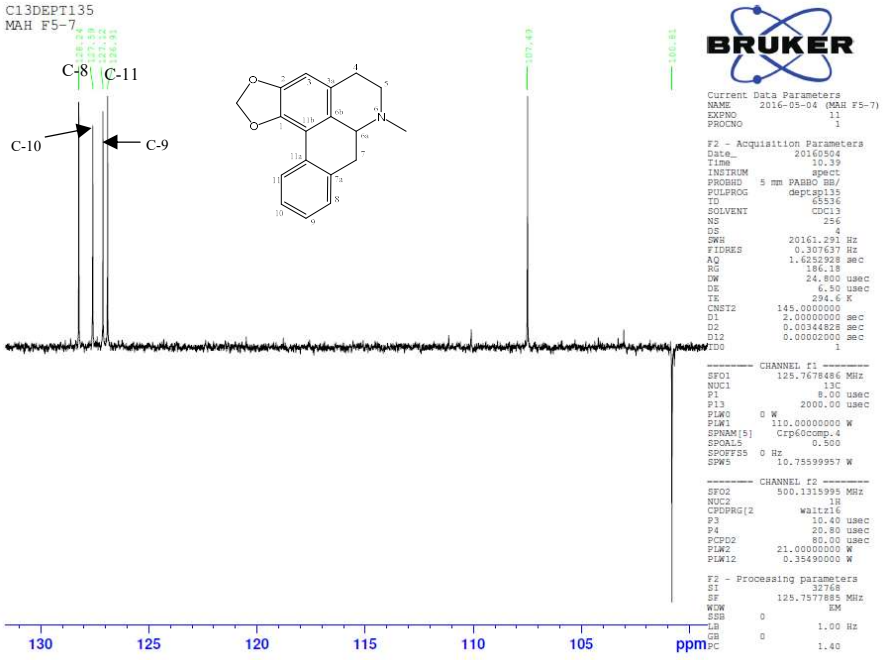
S31: ^{13}C-NMR (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



S32: Expansion of the ^{13}C-NMR (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



S33: Expansion of the DEPT (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



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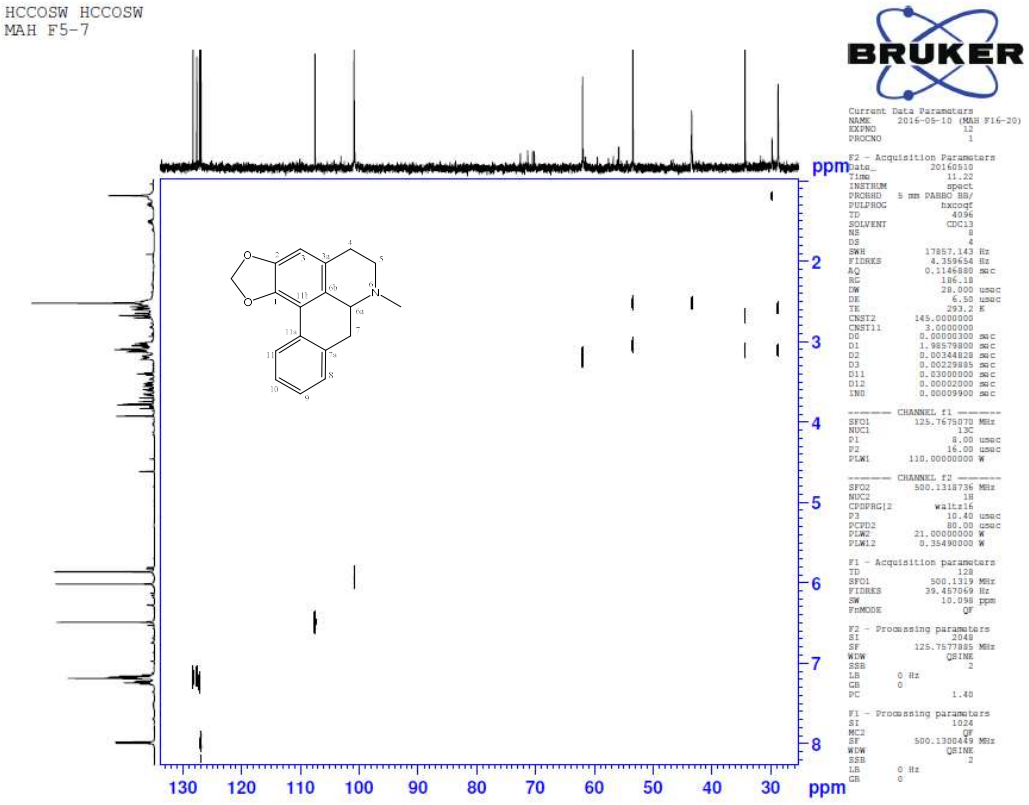
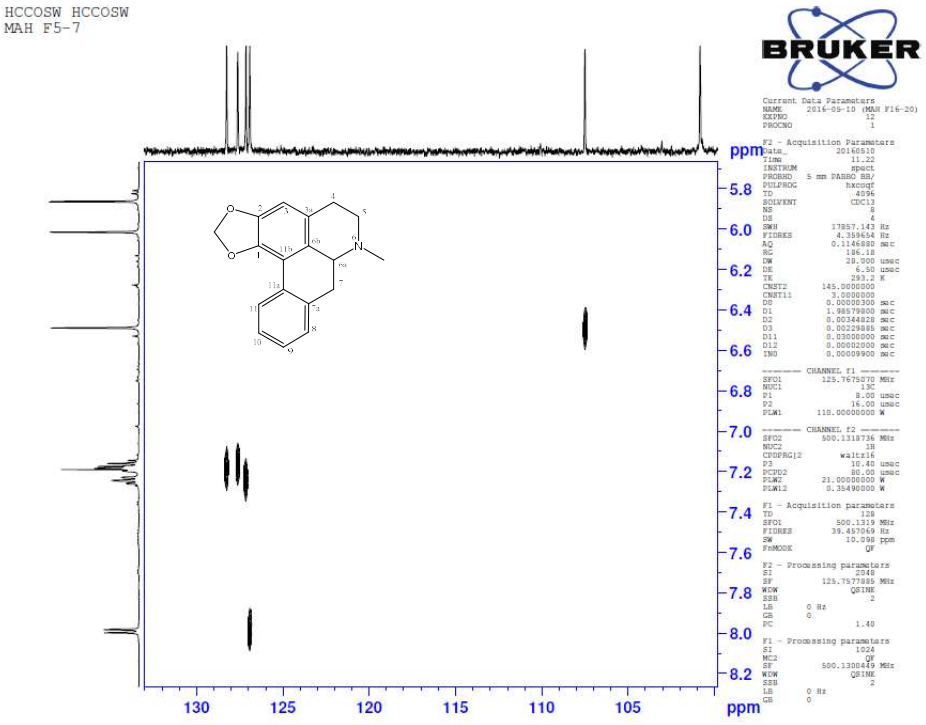
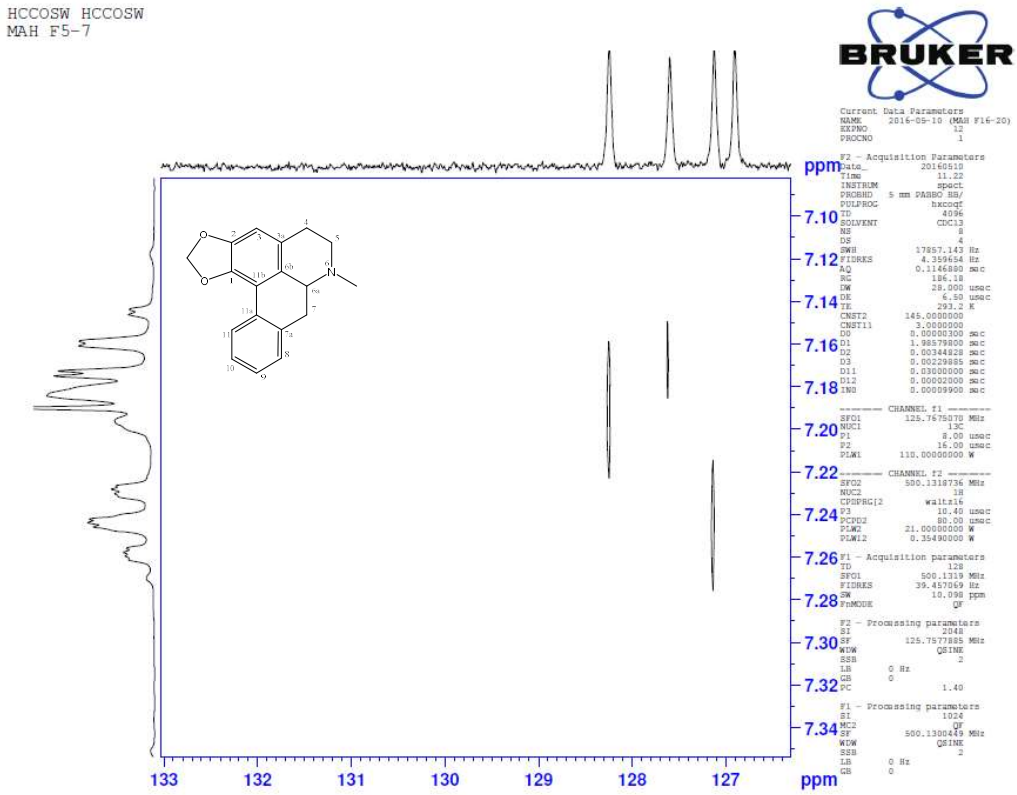


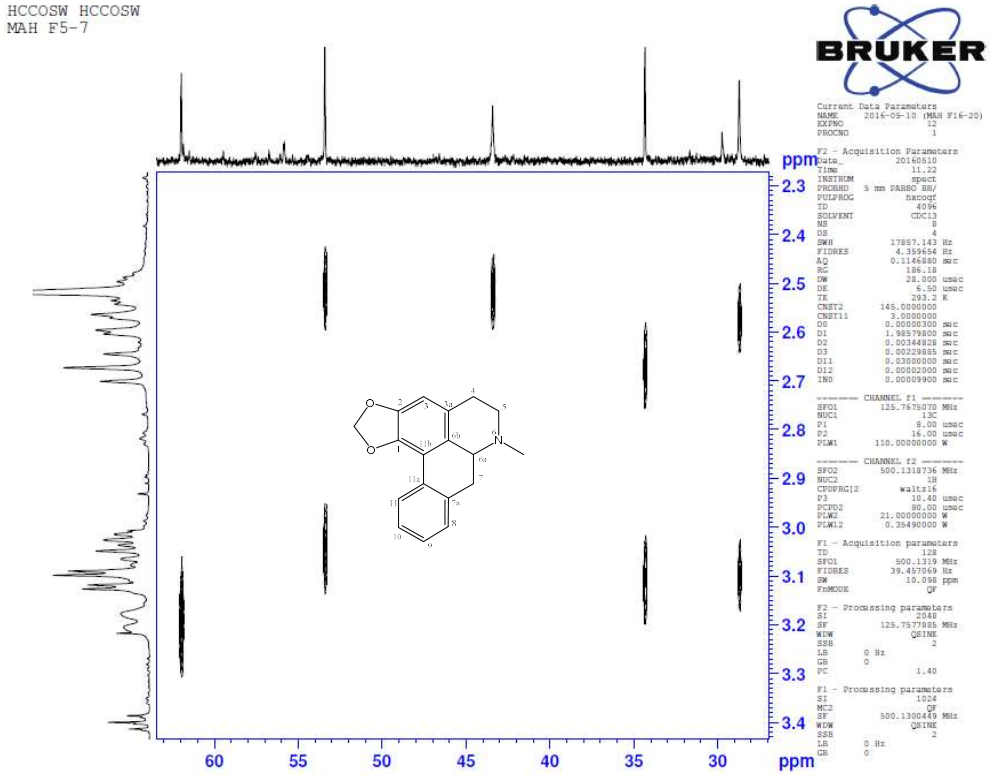
S35: HCCOW Spectrum of Compound **2** (reomerine)



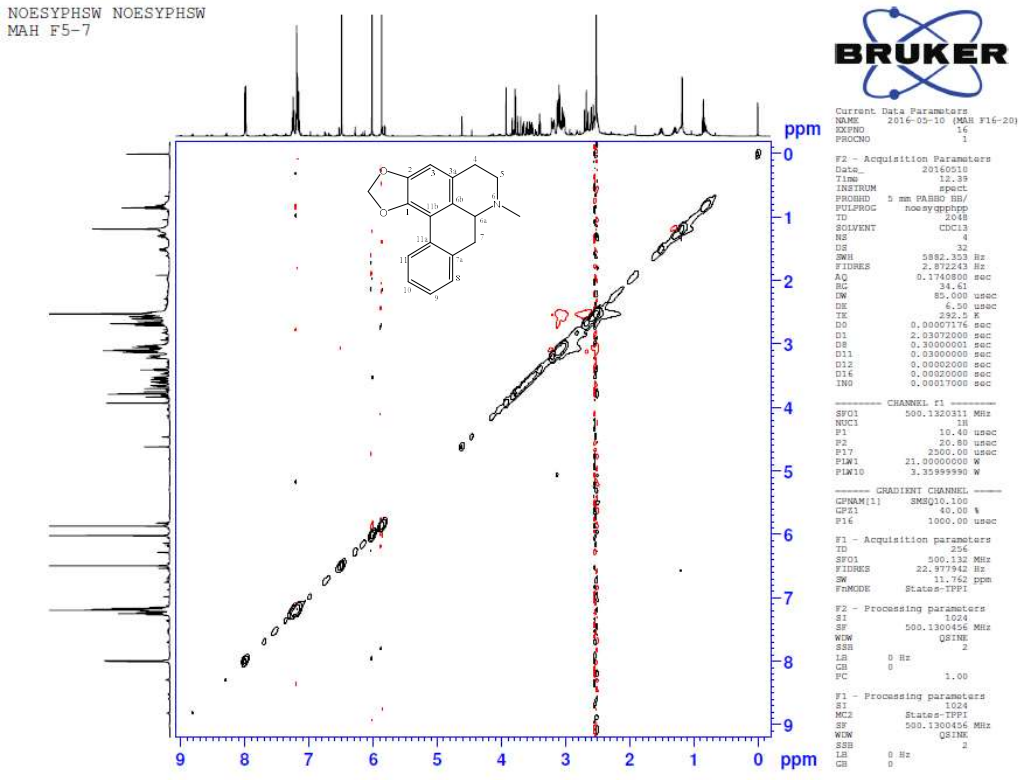
S36: Expansion of the HCCOW Spectrum of Compound **2** (reomerine)



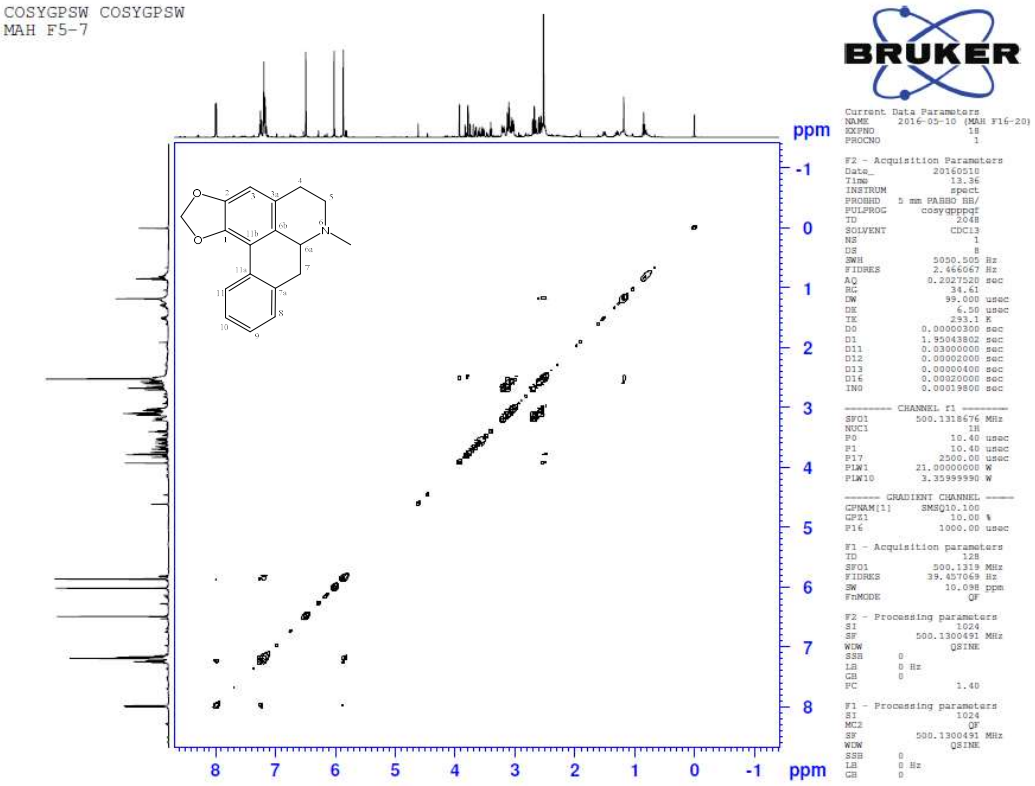
S37: Expansion of the HCCOW Spectrum of Compound **2** (reomerine)



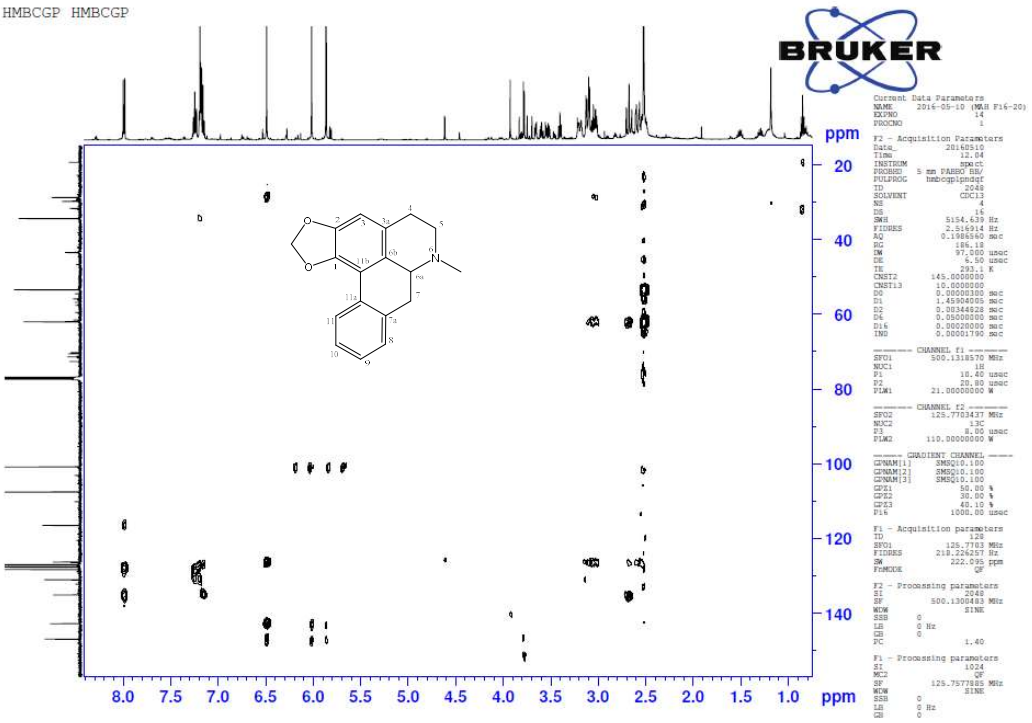
S38: Expansion of the HCCOW Spectrum of Compound **2** (reomerine)



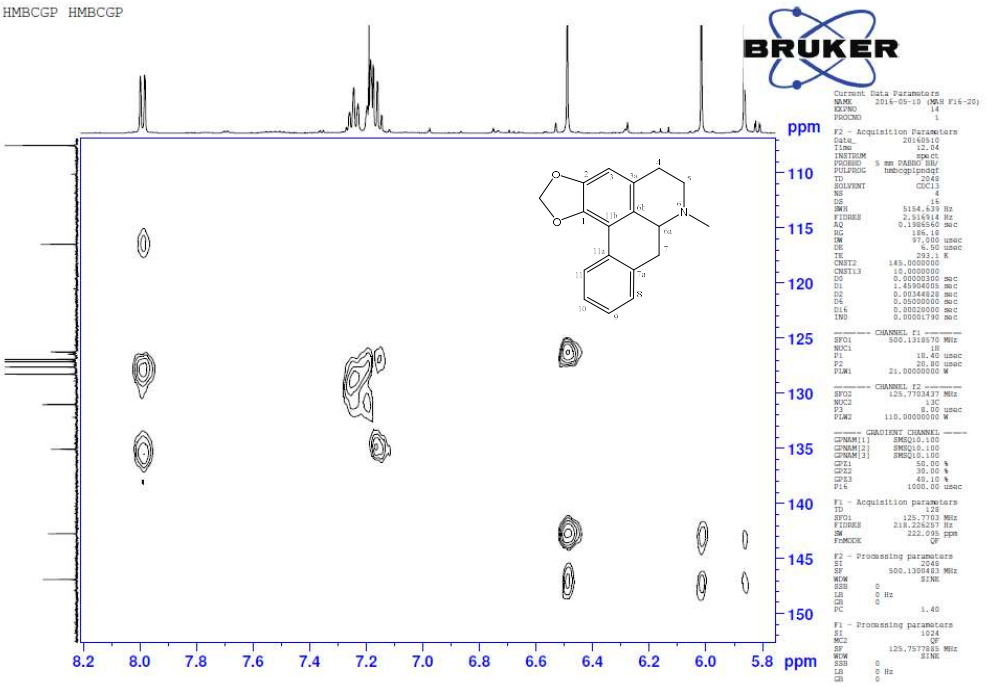
S39: NOSY (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



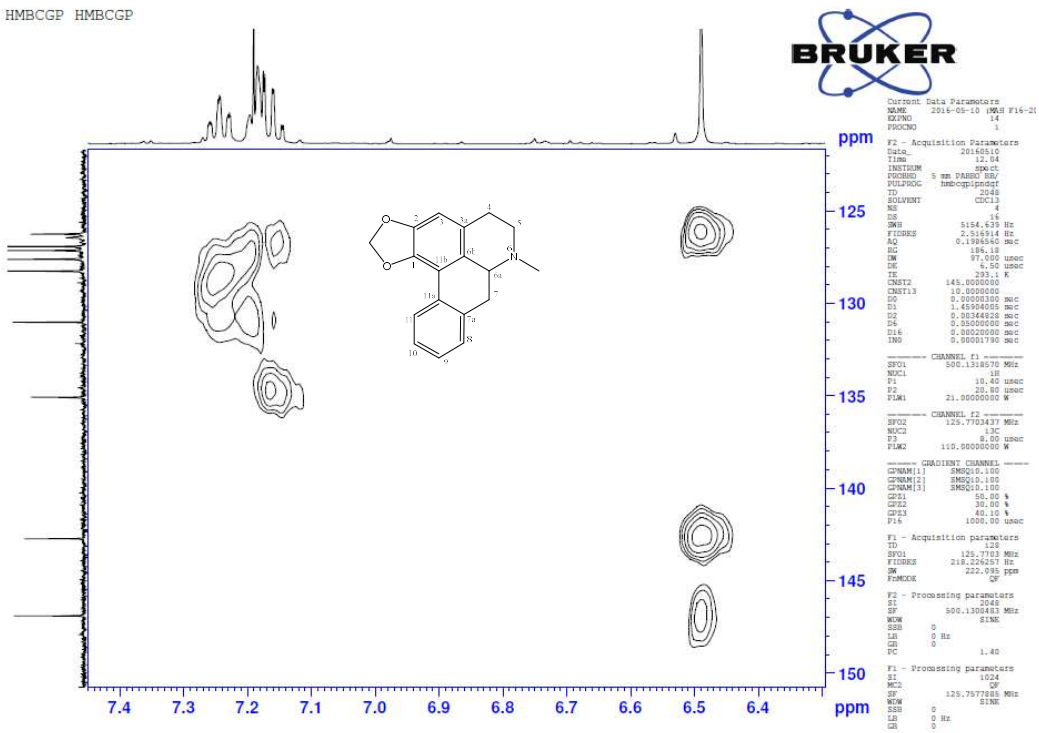
S40: COSY (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



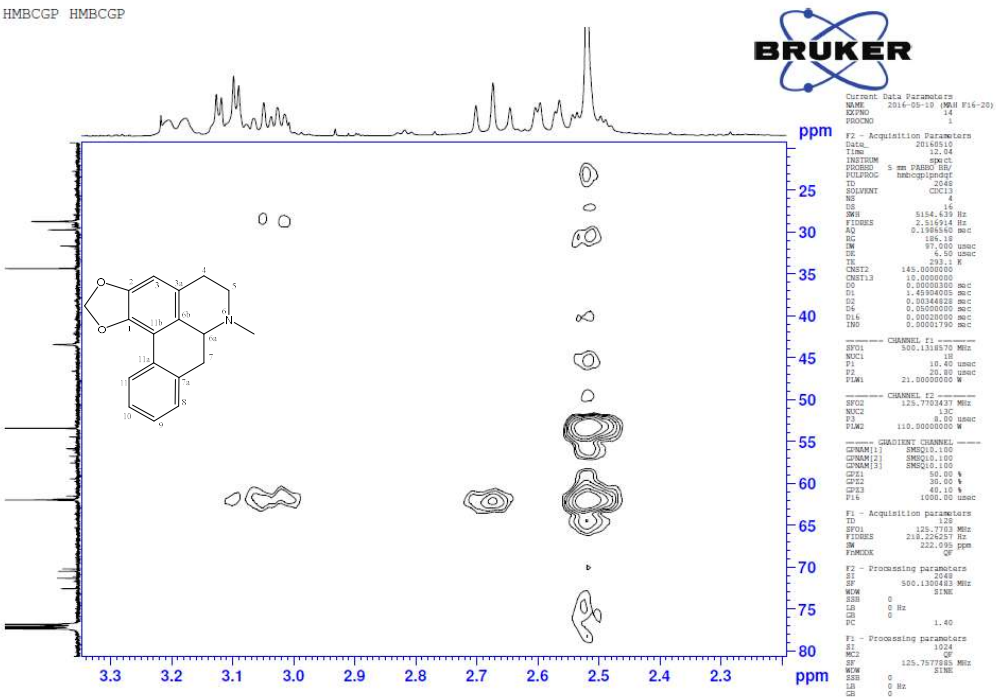
S41: HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



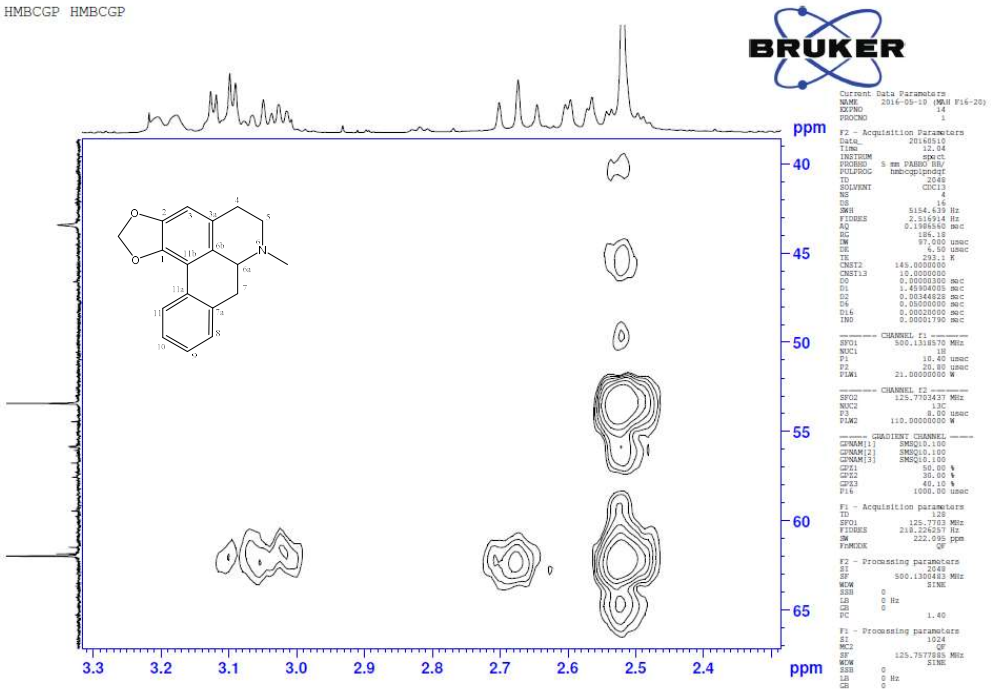
S42: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



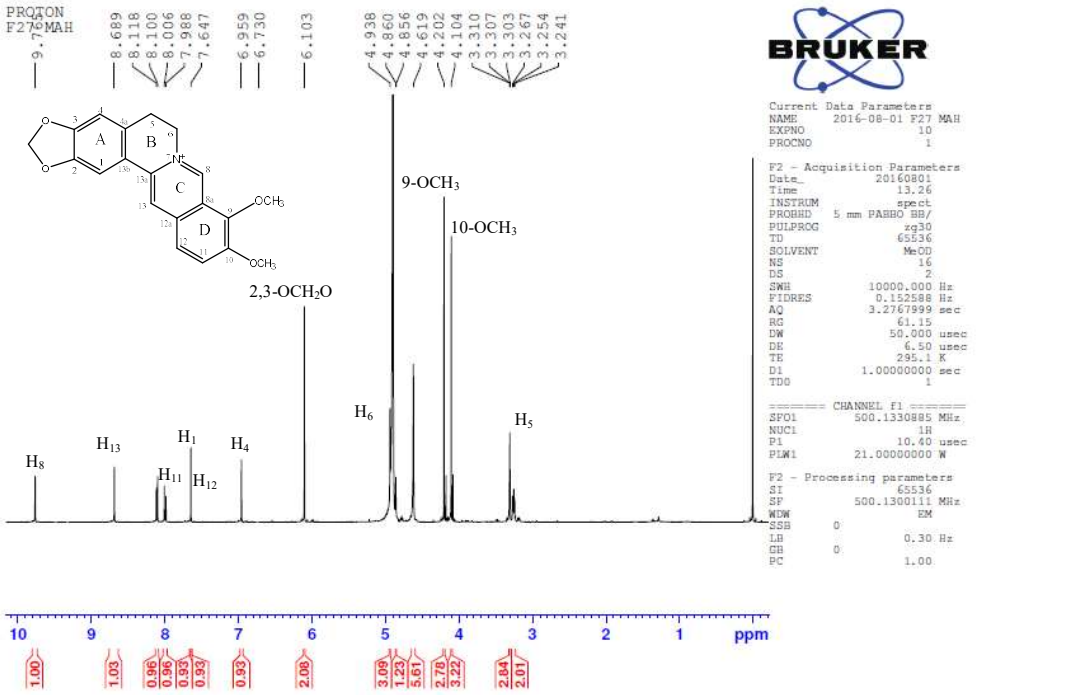
S43: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



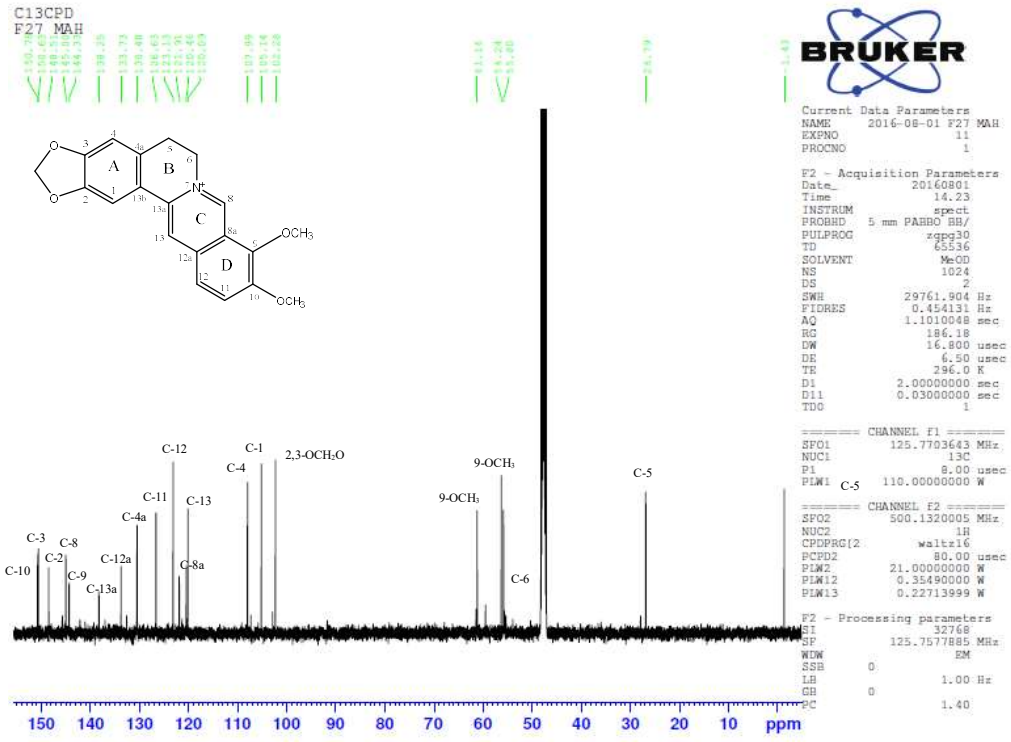
S44: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



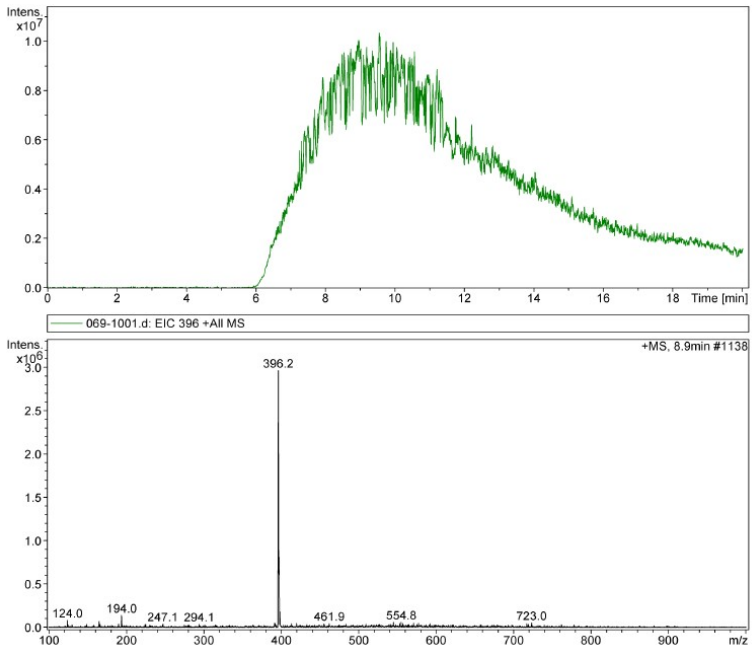
S45: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **2** (reomerine)



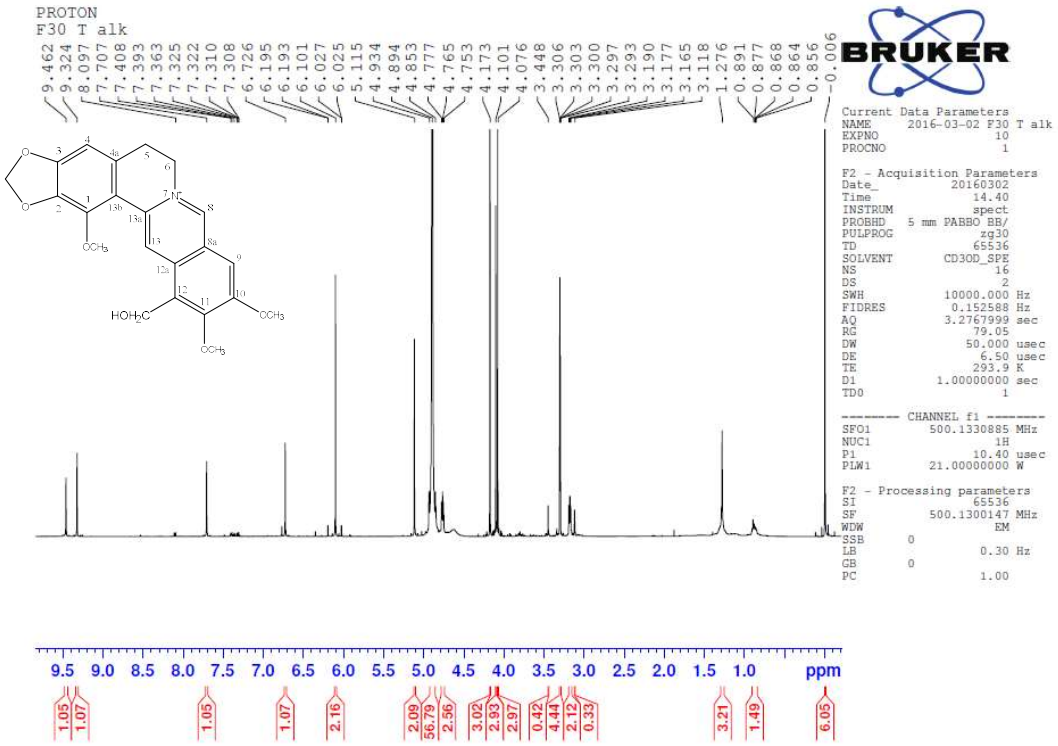
S46: ^{1}H-NMR (500 MHz, $CDCl_3$) Spectrum of Compound **3** (berberine)



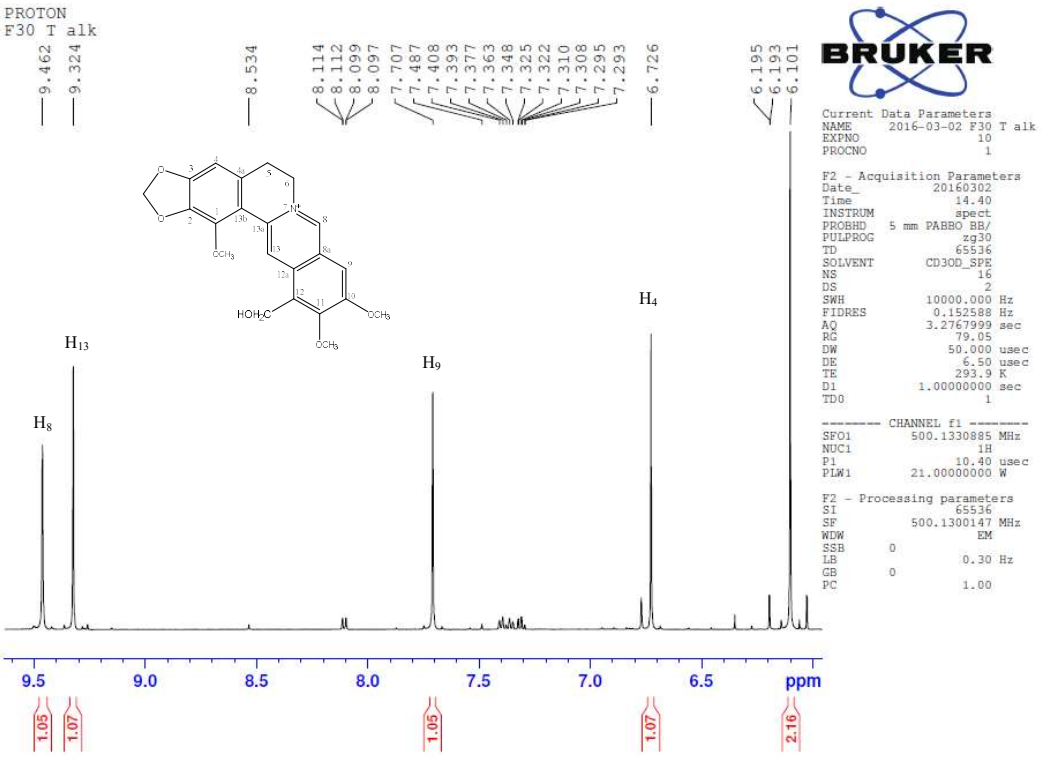
S47: ^{13}C-NMR (500 MHz) Spectrum of Compound **3** (berberine)



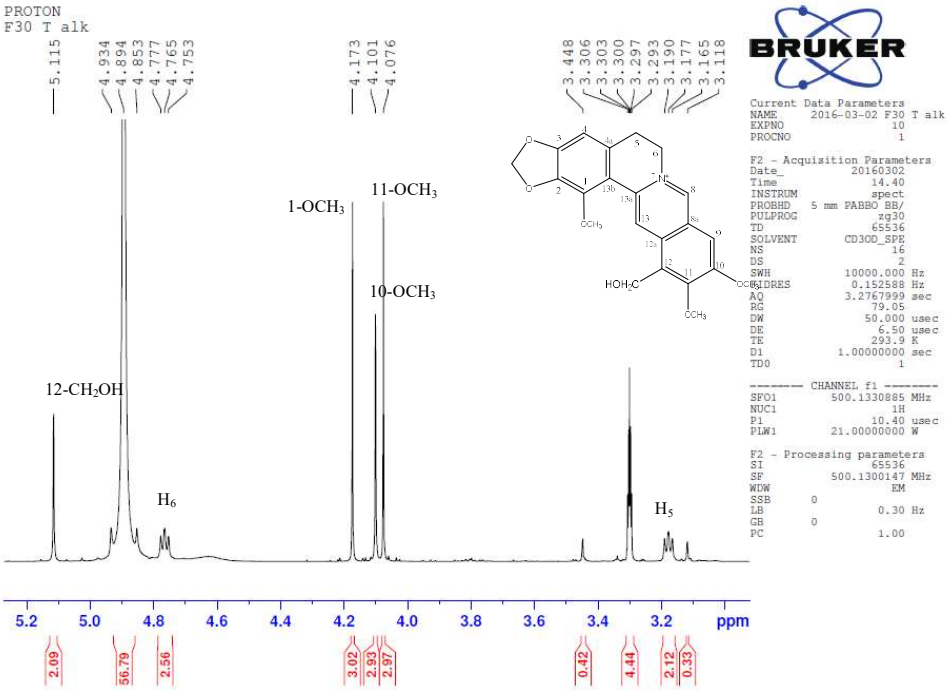
S48: LC-MS Spectrum of Compound **4** (alborine)



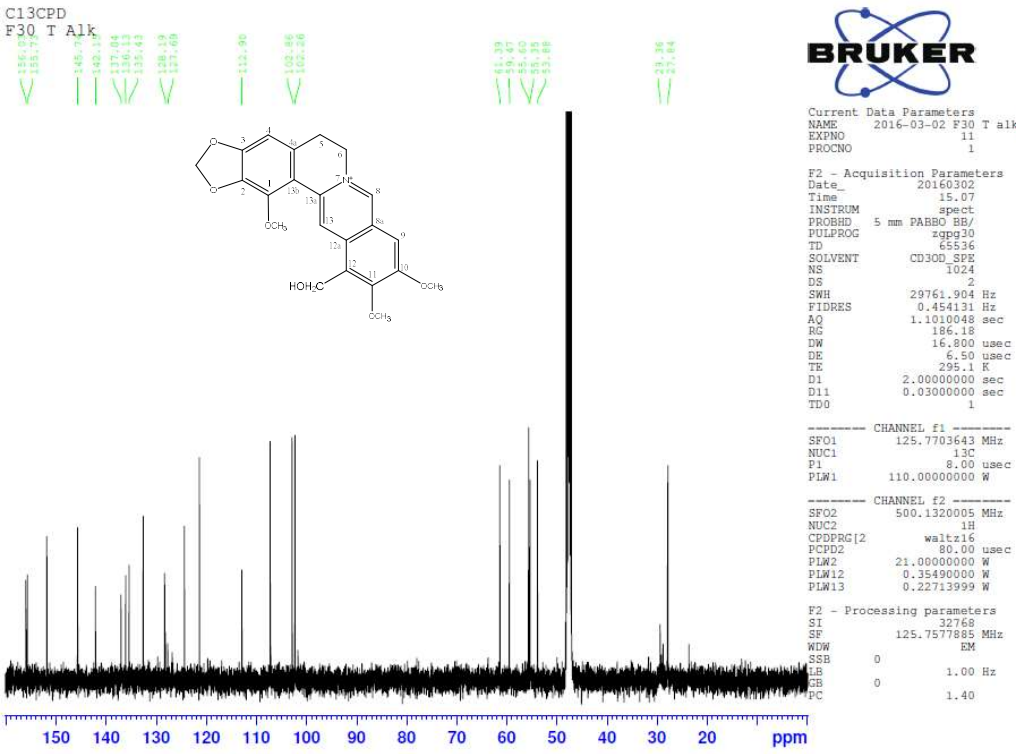
S49: ^{1}H-NMR (500 MHz, CD_3OD) Spectrum of Compound **4** (alborine)



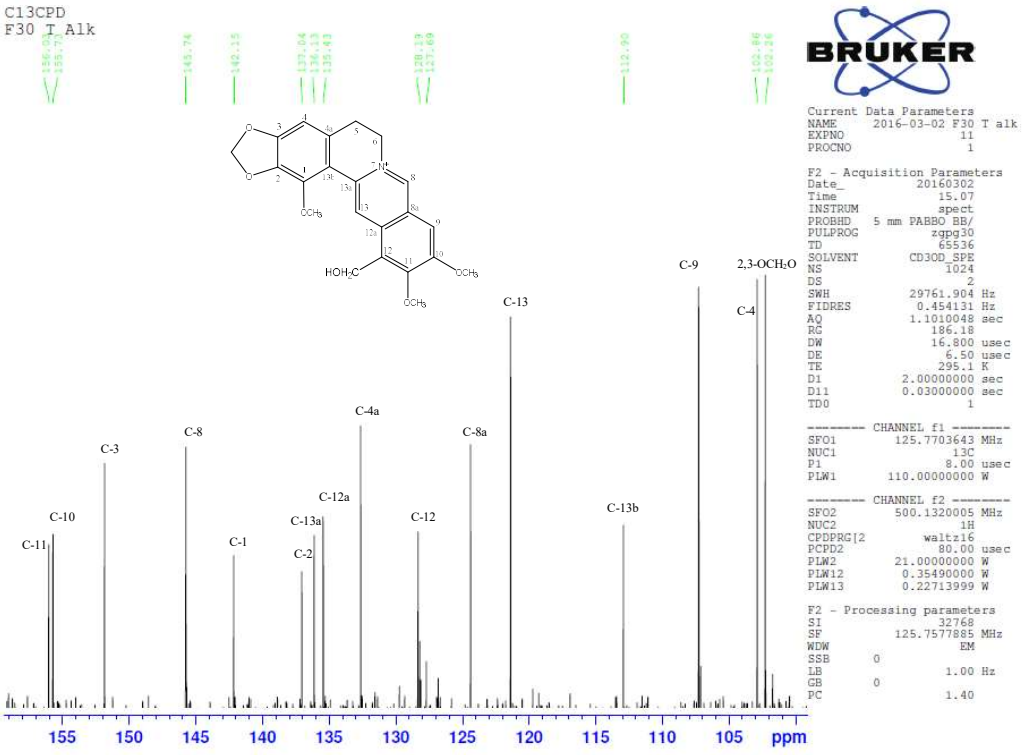
S50: Expansion of the ^{1}H-NMR (500 MHz, CD_3OD) Spectrum of Compound **4** (alborine)



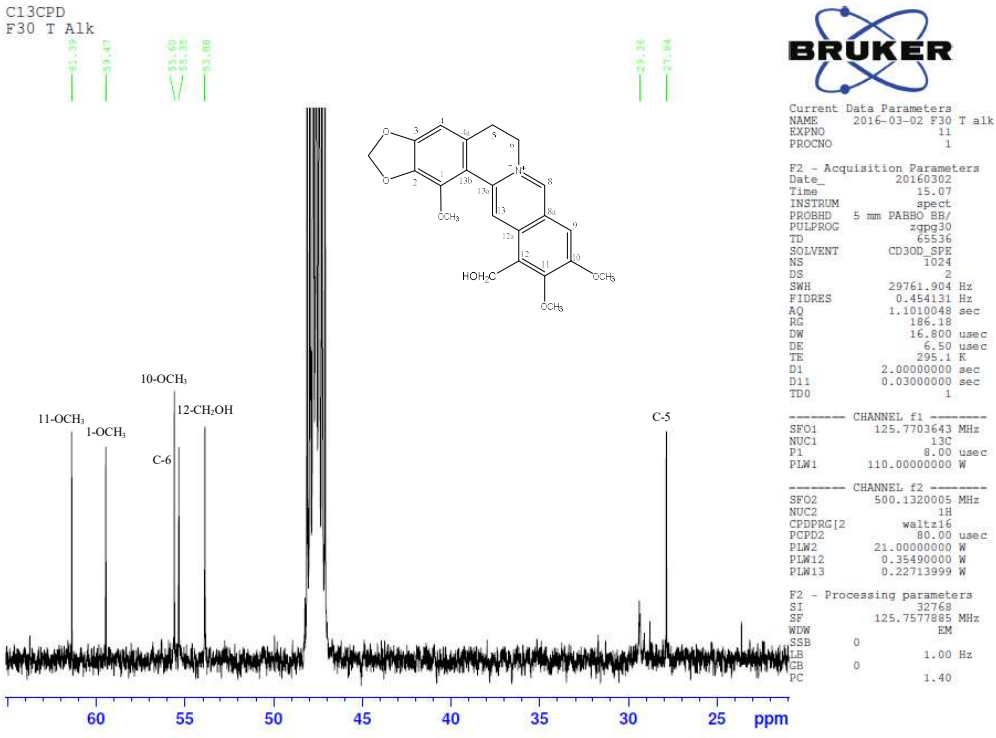
S51: Expansion of the ^{1}H-NMR (500 MHz, CD_3OD) Spectrum of Compound **4** (alborine)



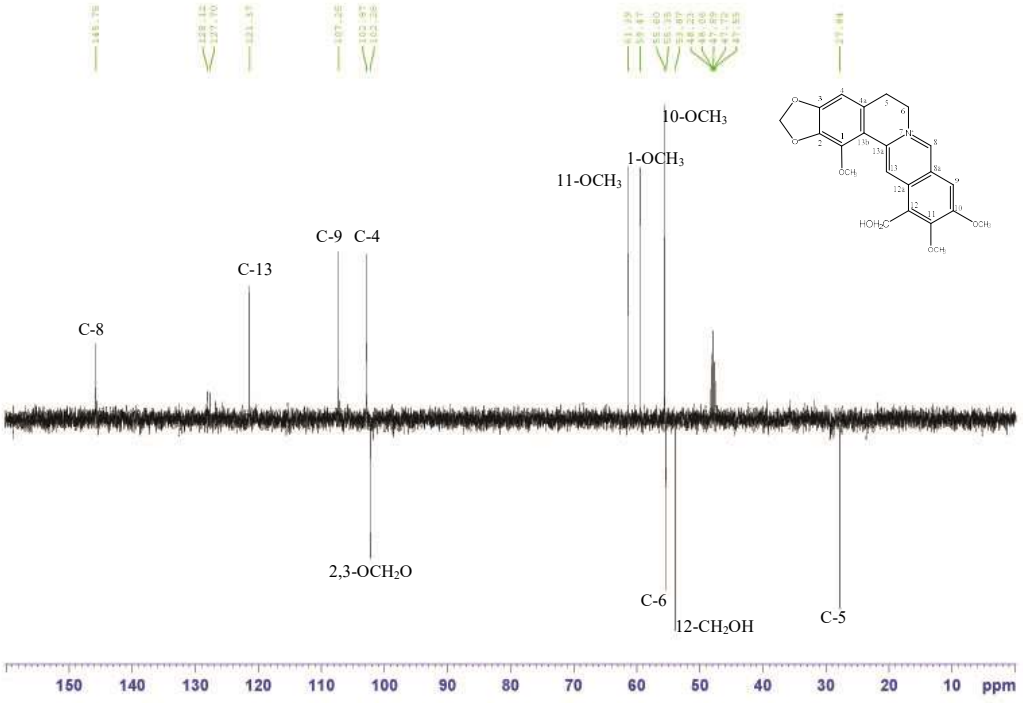
S52: ^{13}C-NMR (500 MHz) Spectrum of Compound **4** (alborine)



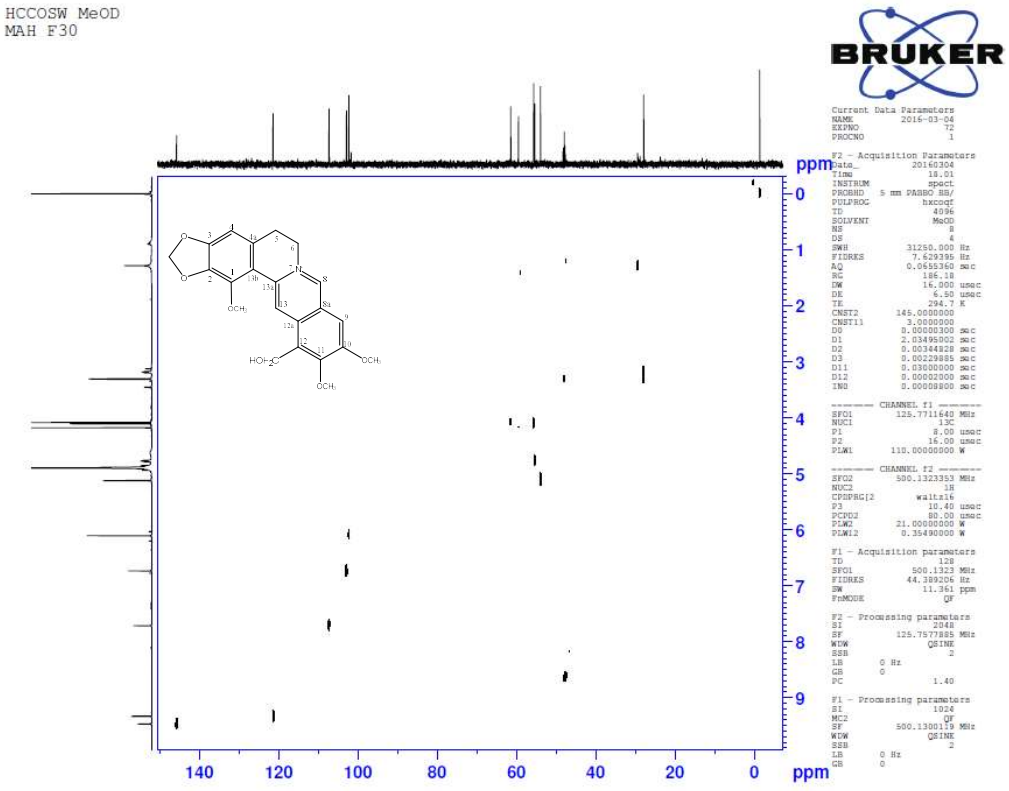
S53: Expansion of the ^{13}C-NMR (500 MHz) Spectrum of Compound **4** (alborine)



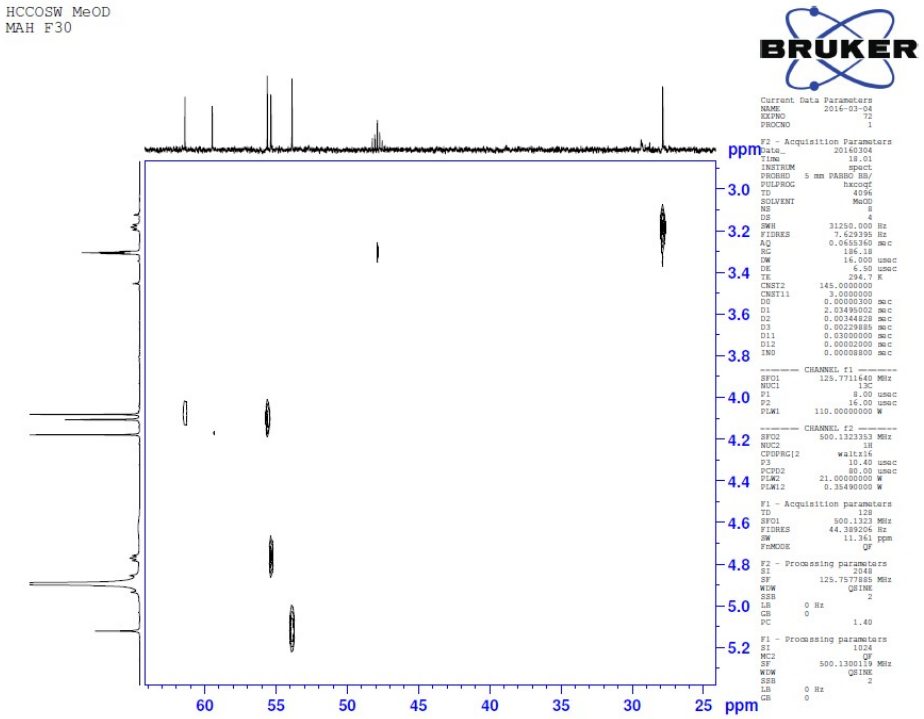
S54: Expansion of the ^{13}C-NMR (500 MHz) Spectrum of Compound **4** (alborine)



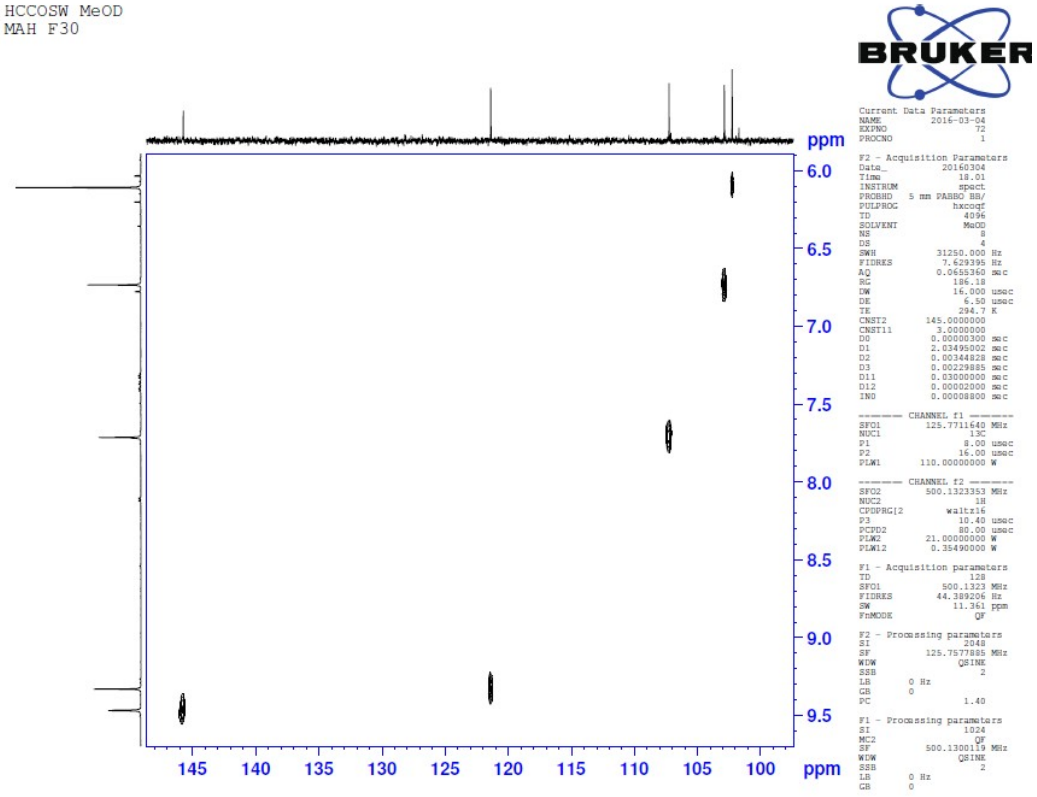
S55: DEPT (500 MHz) Spectrum of Compound **4** (alborine)



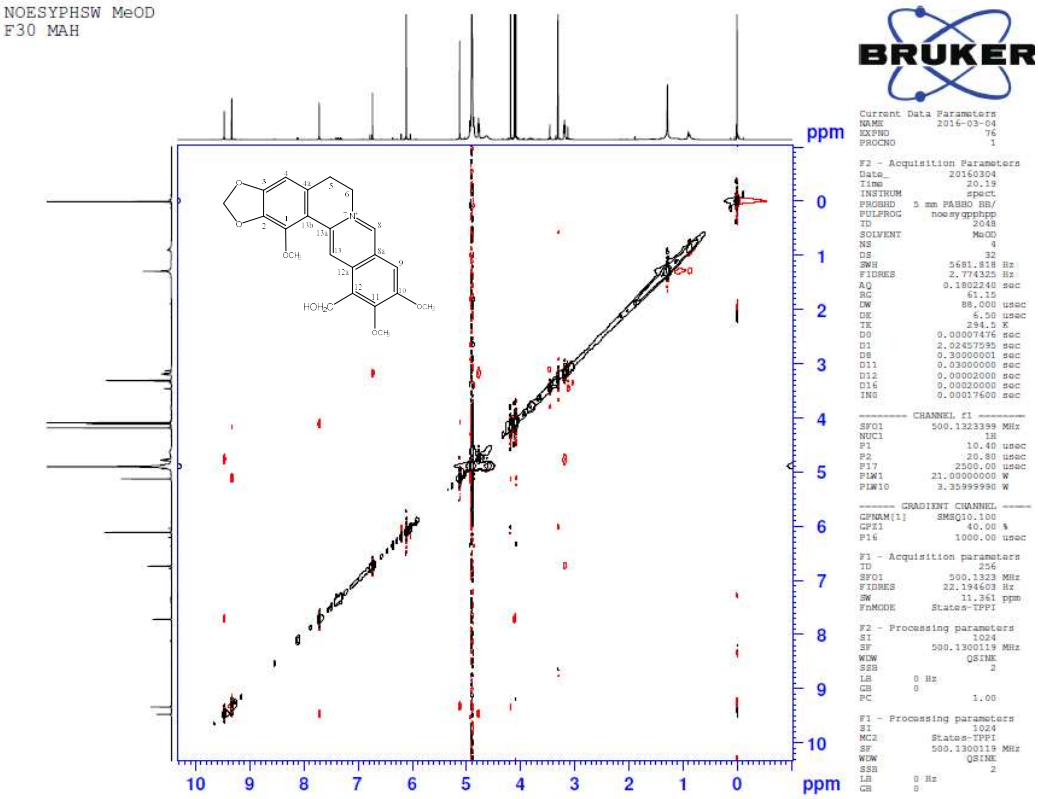
S56: HCCOW Spectrum of Compound **4** (alborine)



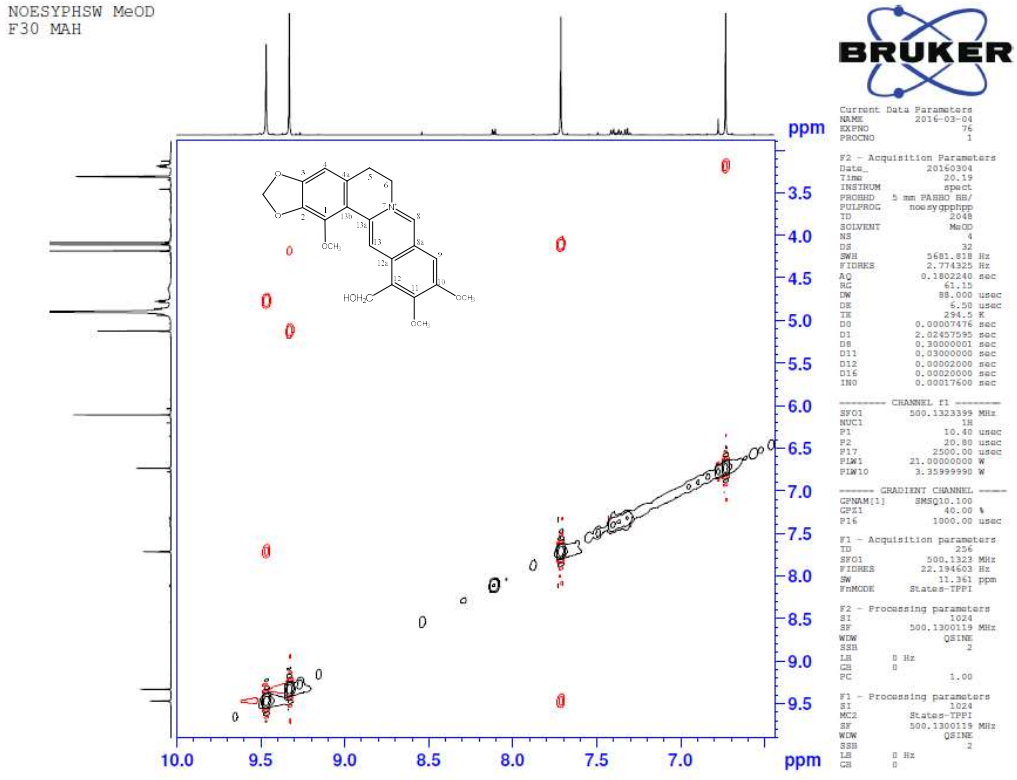
S57: Expansion of the HCCOW Spectrum of Compound **4** (alborine)



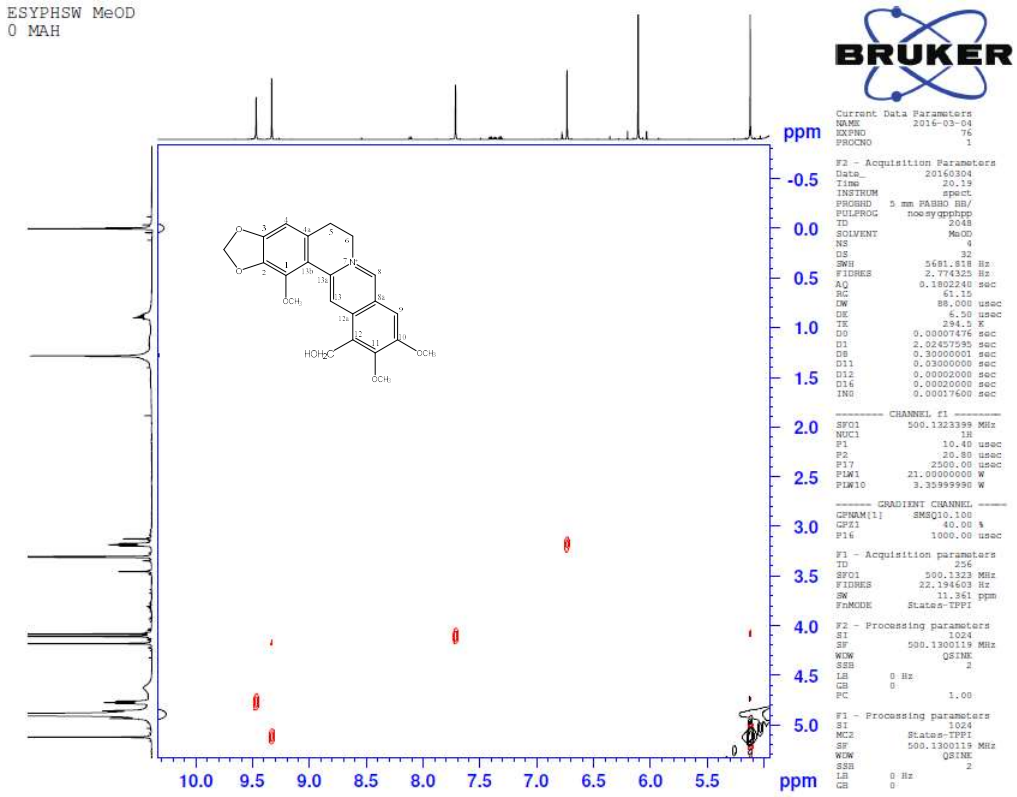
S58: Expansion of the HCCOW Spectrum of Compound **4** (alborine)



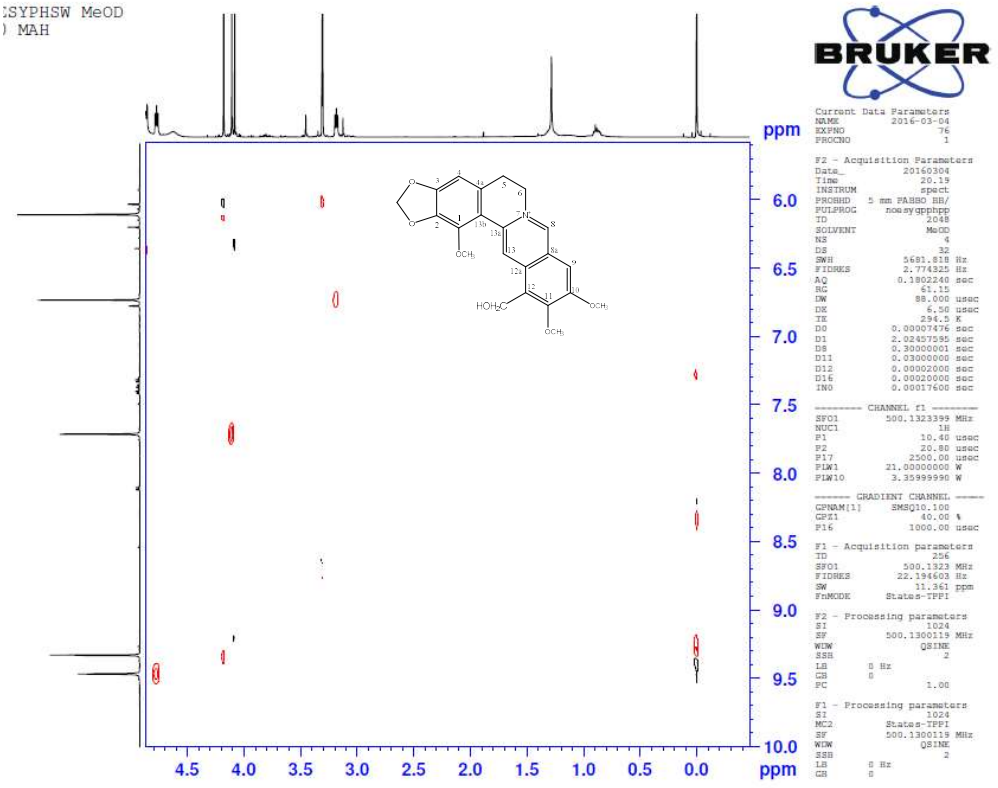
S59: NOSY (500 MHz) Spectrum of Compound **4** (alborine)



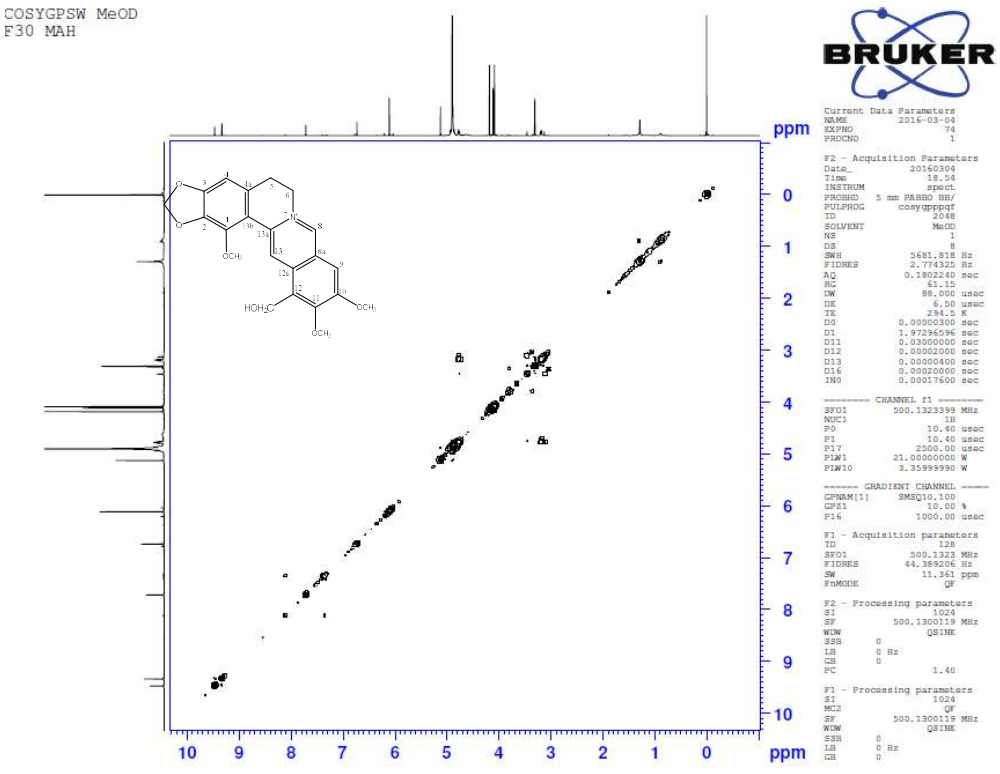
S60: Expansion of the NOSY (500 MHz) Spectrum of Compound **4** (alborine)



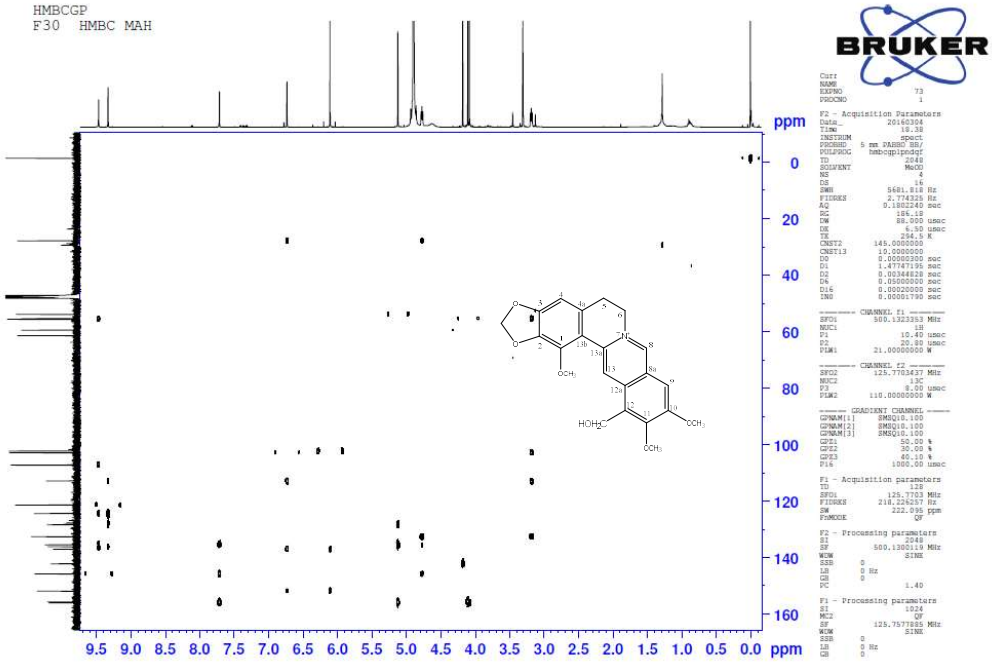
S61: Expansion of the NOSY (500 MHz) Spectrum of Compound **4** (alborine)



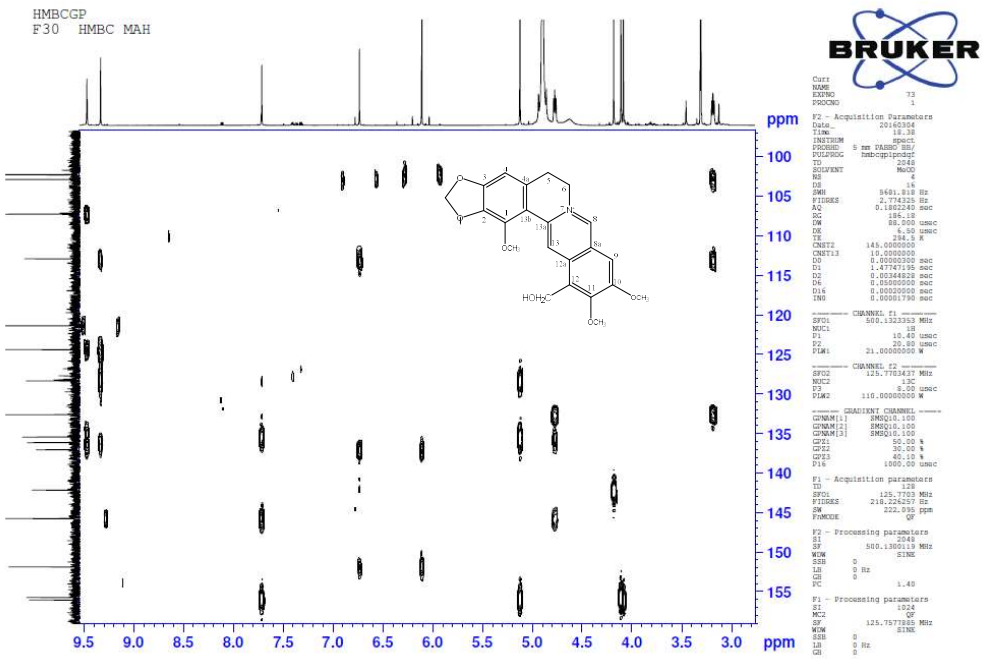
S62: Expansion of the NOSY (500 MHz) Spectrum of Compound **4** (alborine)



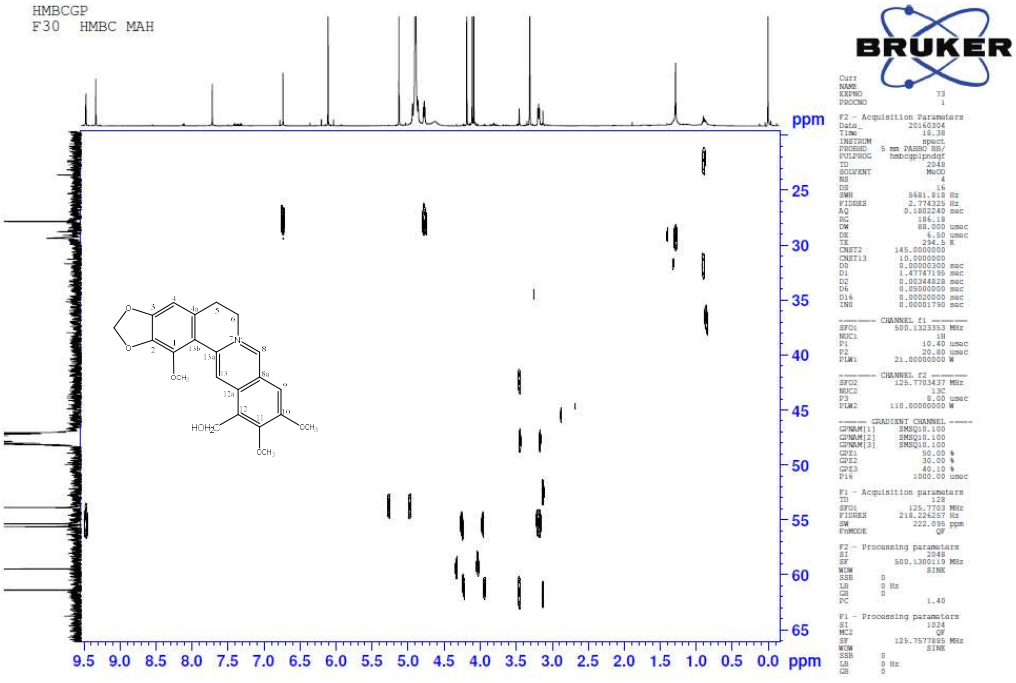
S63: COSY (500 MHz) Spectrum of Compound **4** (alborine)



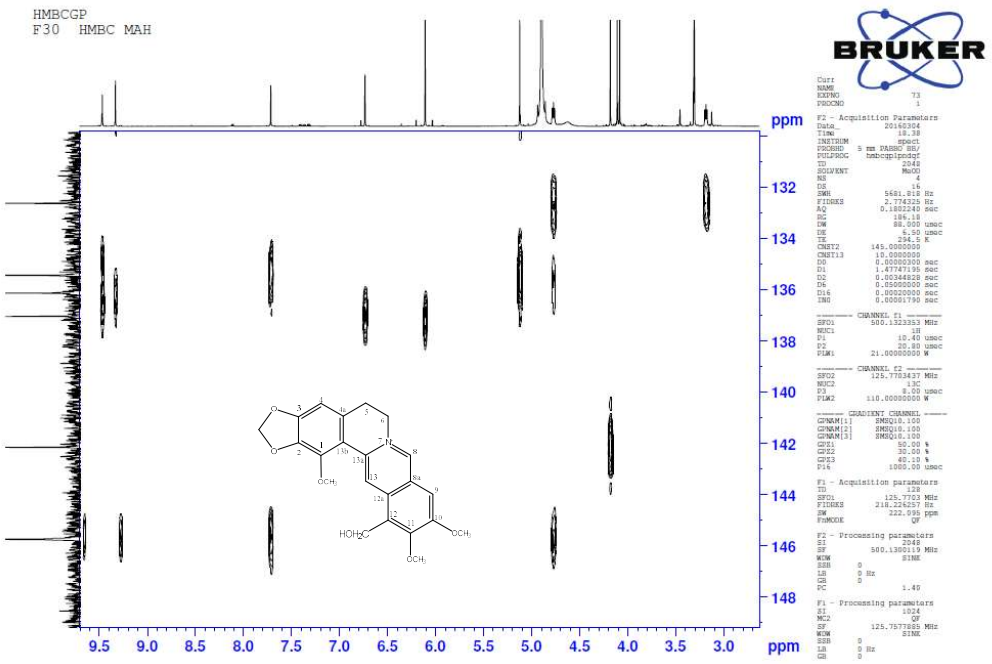
S64: HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **4** (alborine)



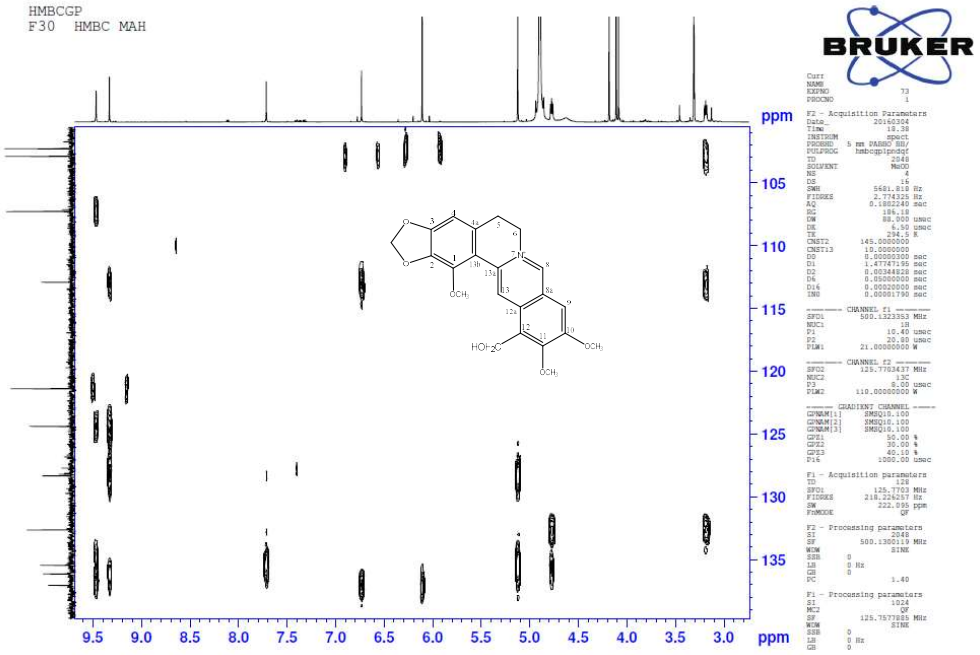
S65: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **4** (alborine)



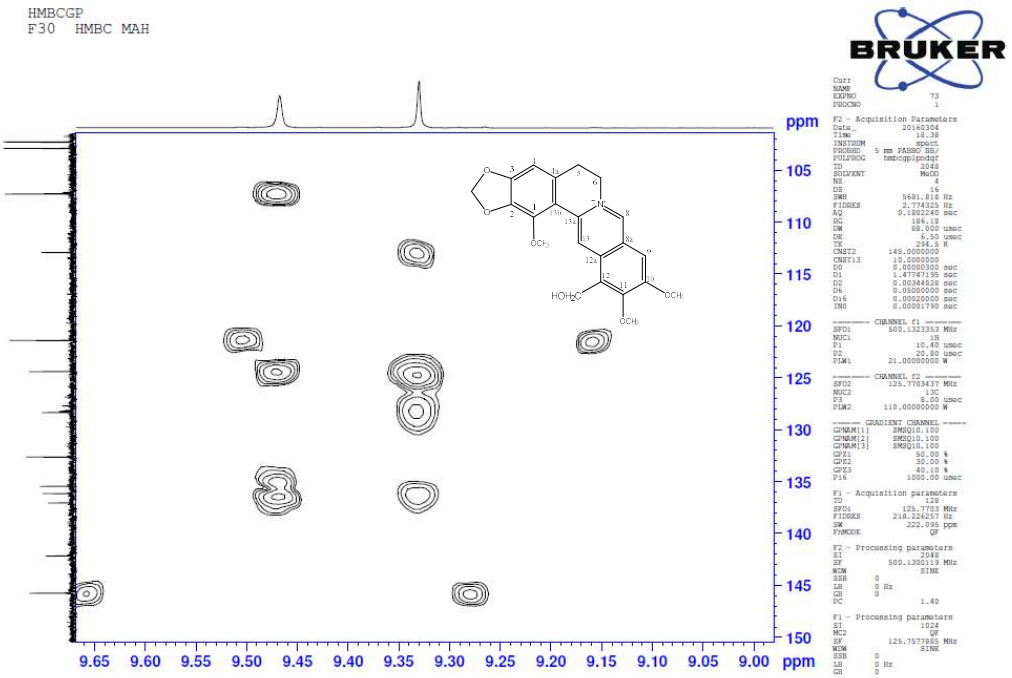
S66: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **4** (alborine)



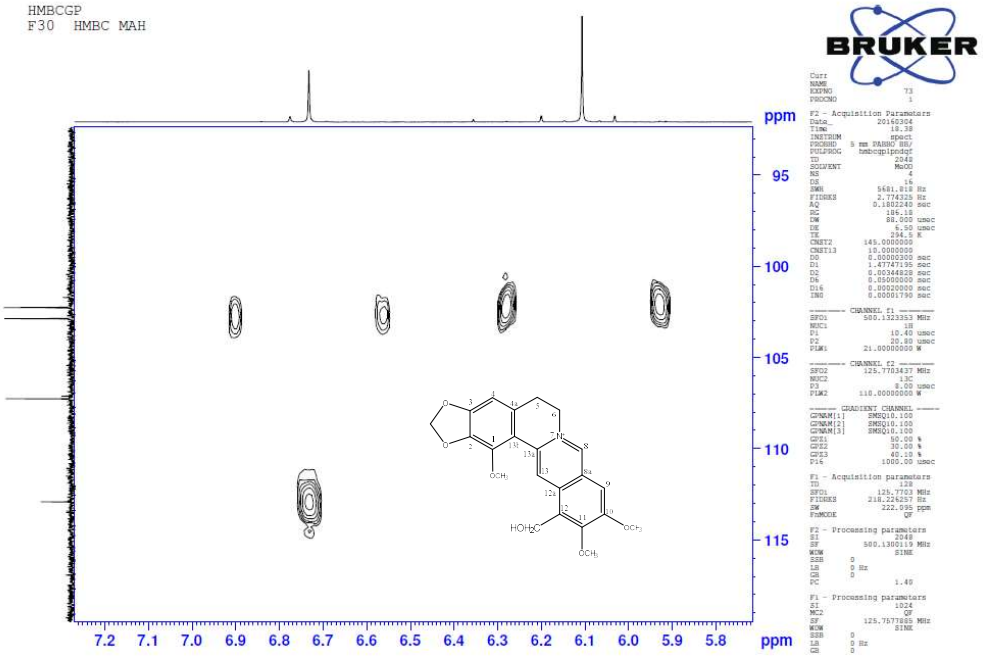
S67: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **4** (alborine)



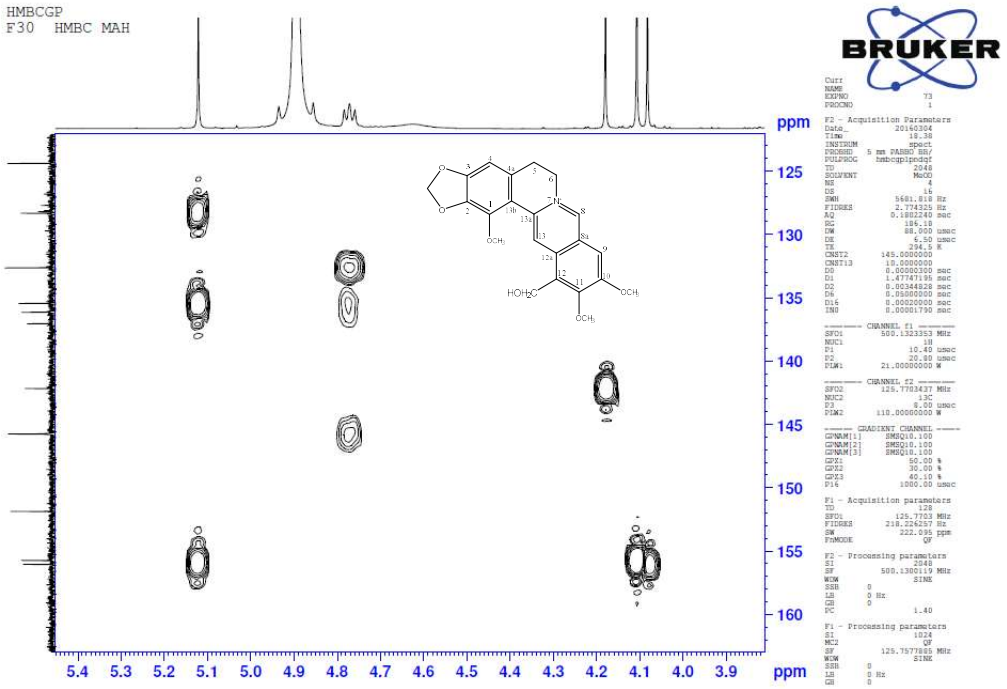
S68: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **4** (alborine)



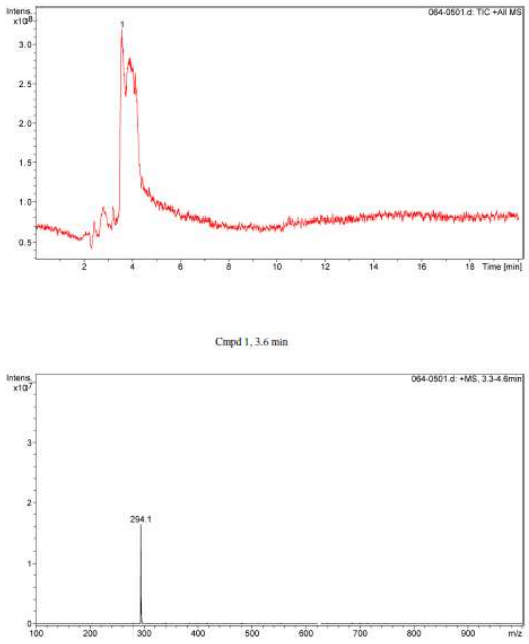
S69: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **4** (alborine)



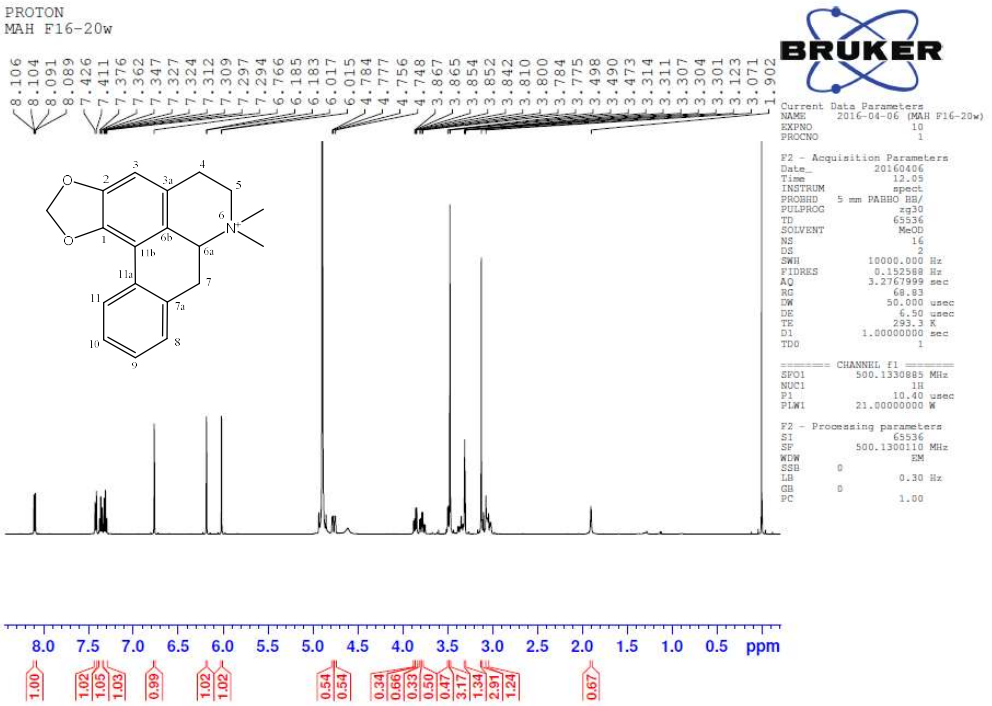
S70: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **4** (alborine)



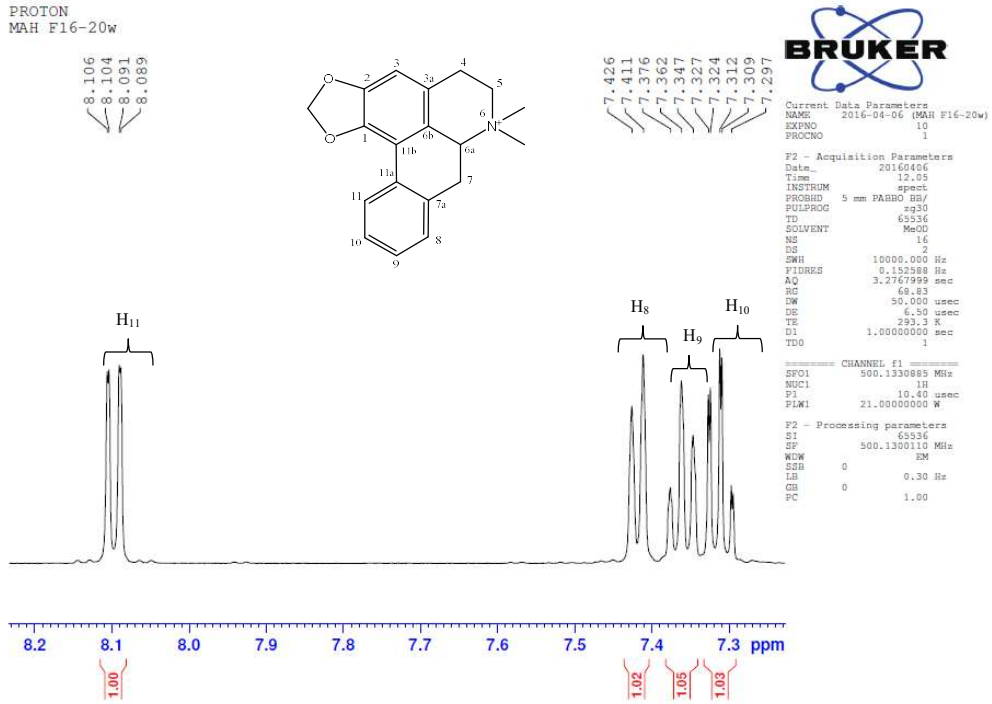
S71: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **4** (alborine)



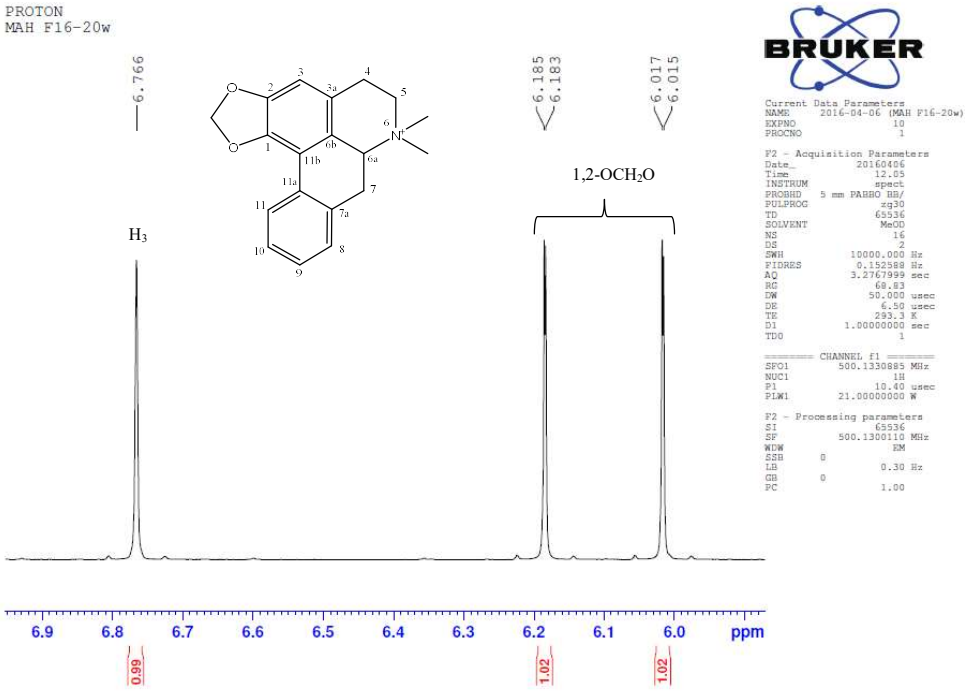
S72: LC-MS Spectrum of Compound **5** (remrefidine)



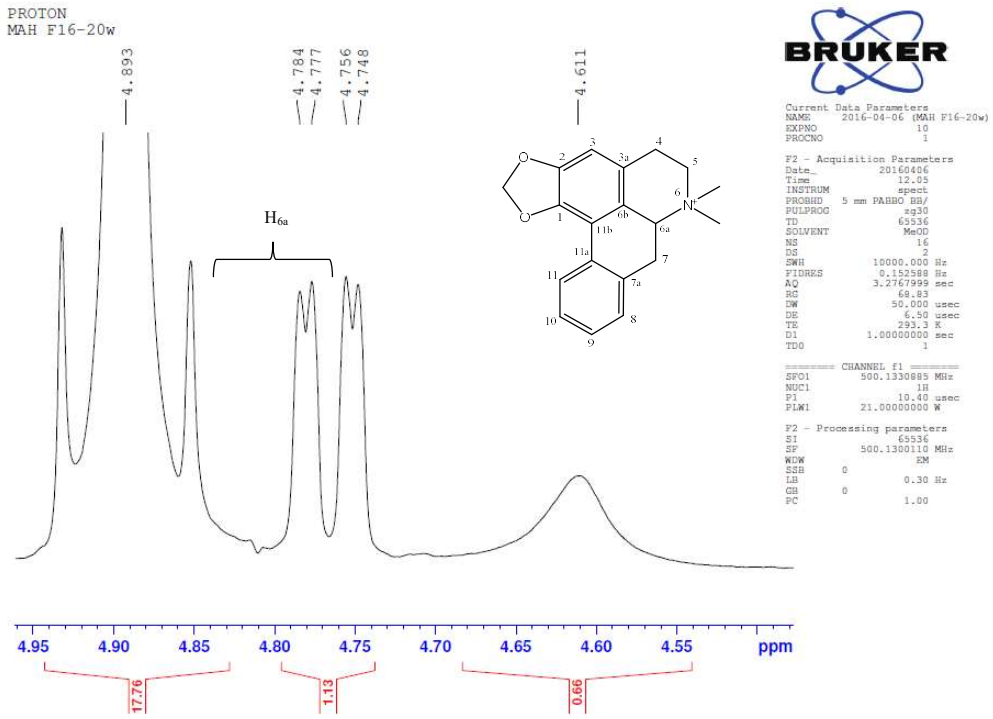
S73: ^{1}H-NMR (500 MHz, CD_3OD) Spectrum of Compound **5** (remrefidine)



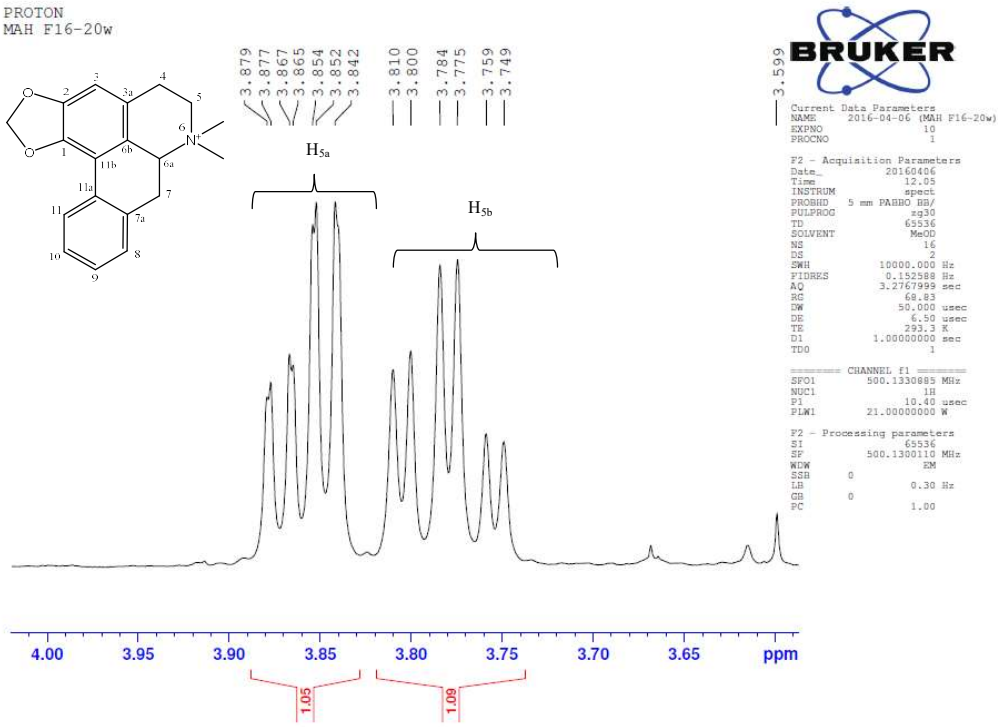
S74: Expansion of the ^{1}H-NMR (500 MHz) Spectrum of Compound **5** (remrefidine)



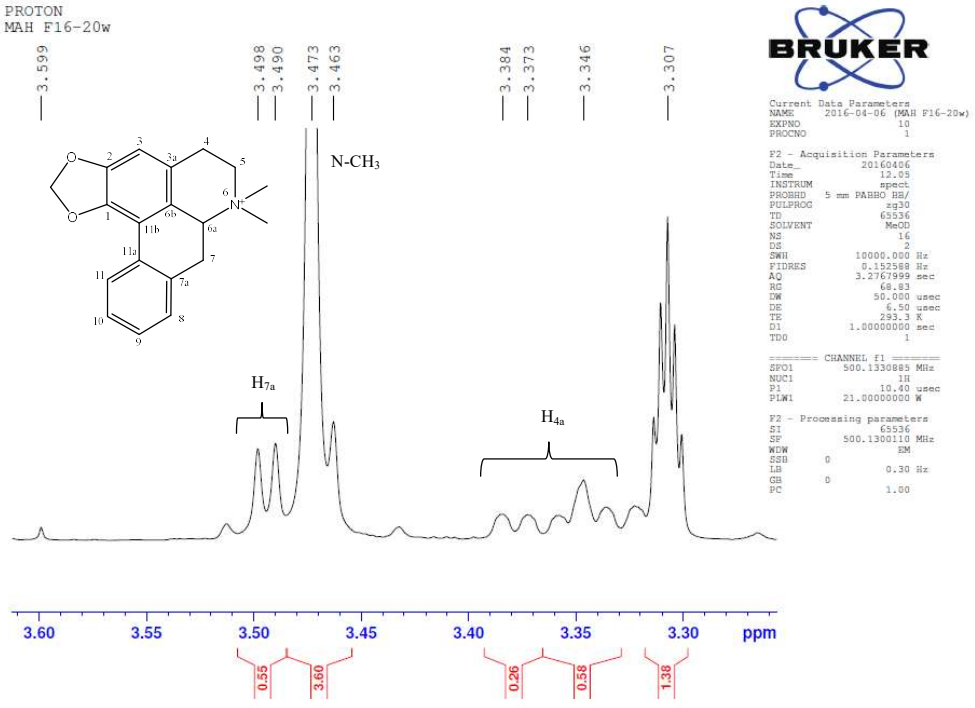
S75: Expansion of the [1]H-NMR (500 MHz) Spectrum of Compound **5** (remrefidine)



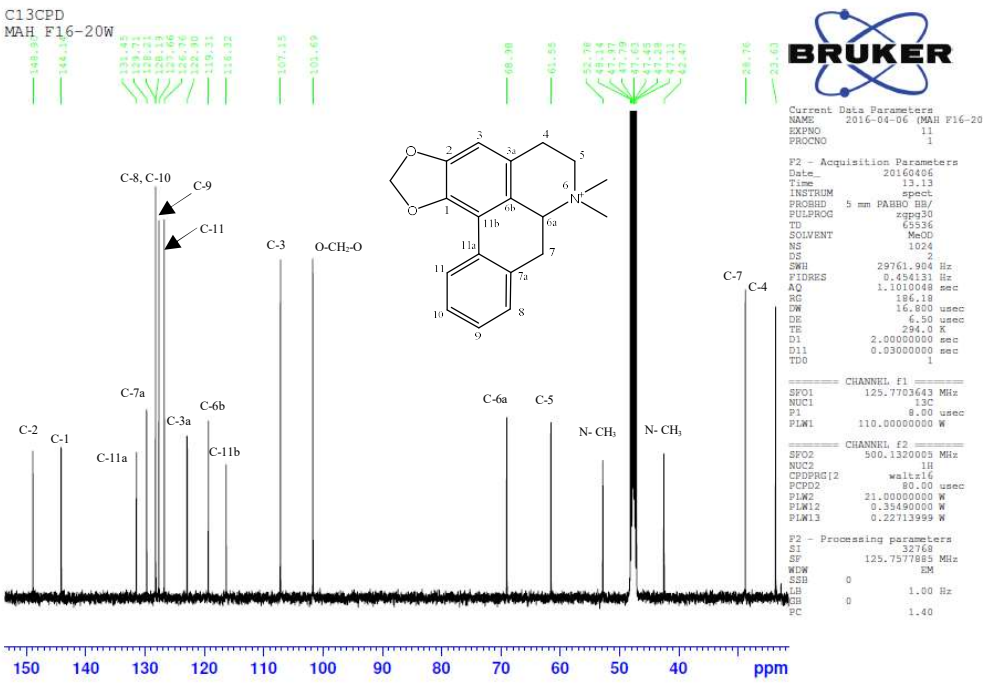
S76: Expansion of the [1]H-NMR (500 MHz) Spectrum of Compound **5** (remrefidine)



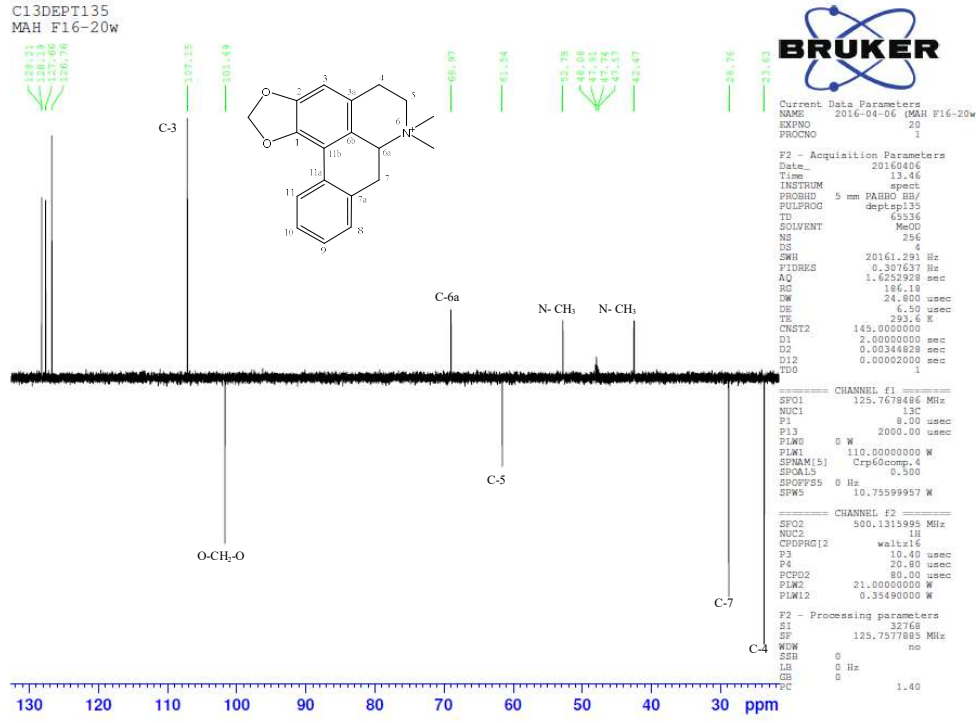
S77: Expansion of the ^{1}H-NMR (500 MHz) Spectrum of Compound **5** (remrefidine)



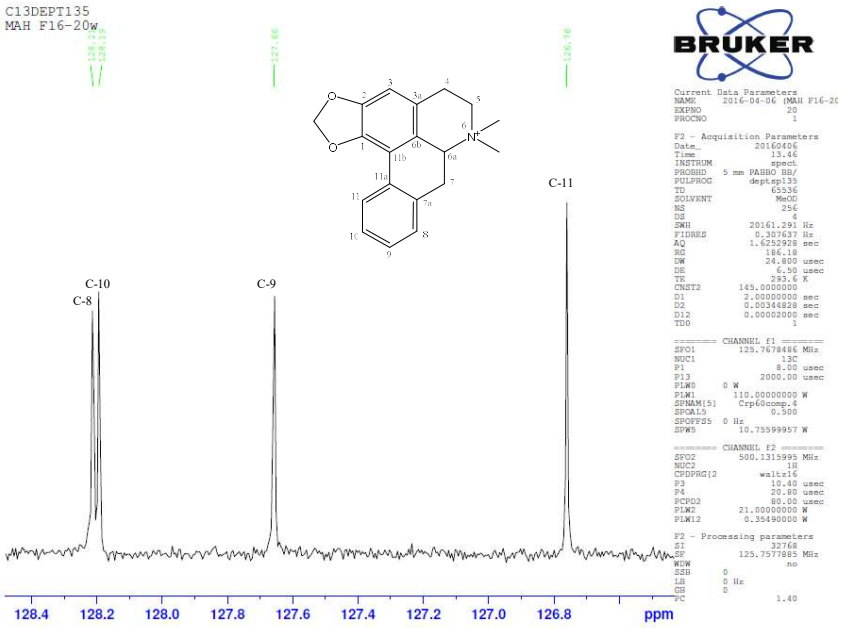
S78: Expansion of the ^{1}H-NMR (500 MHz) Spectrum of Compound **5** (remrefidine)



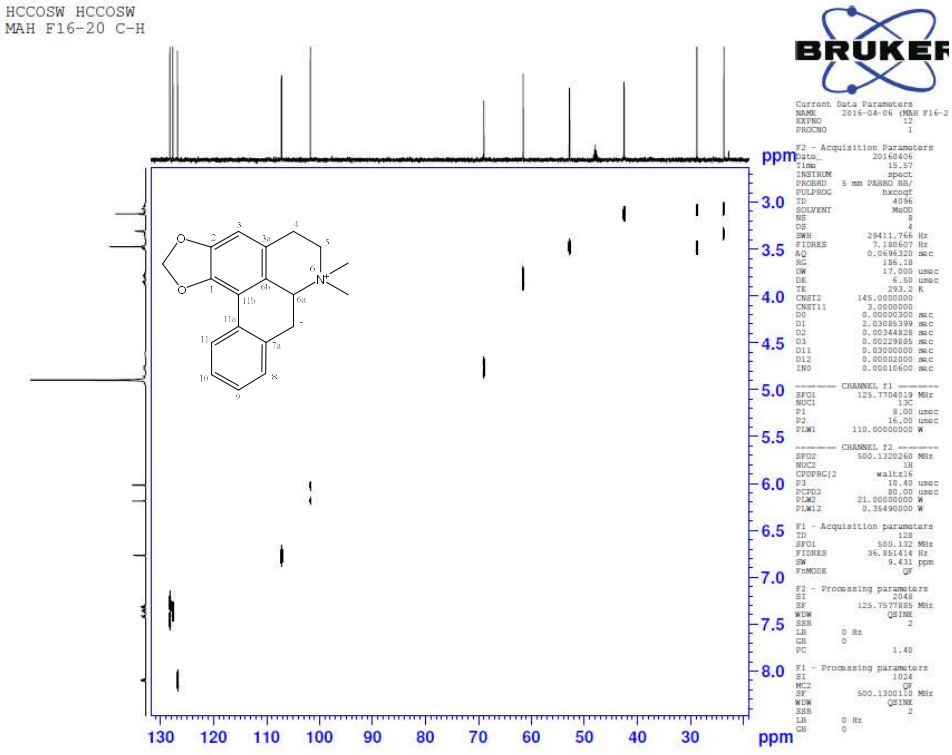
S79: ^{13}C-NMR (500 MHz) Spectrum of Compound **5** (remrefidine)



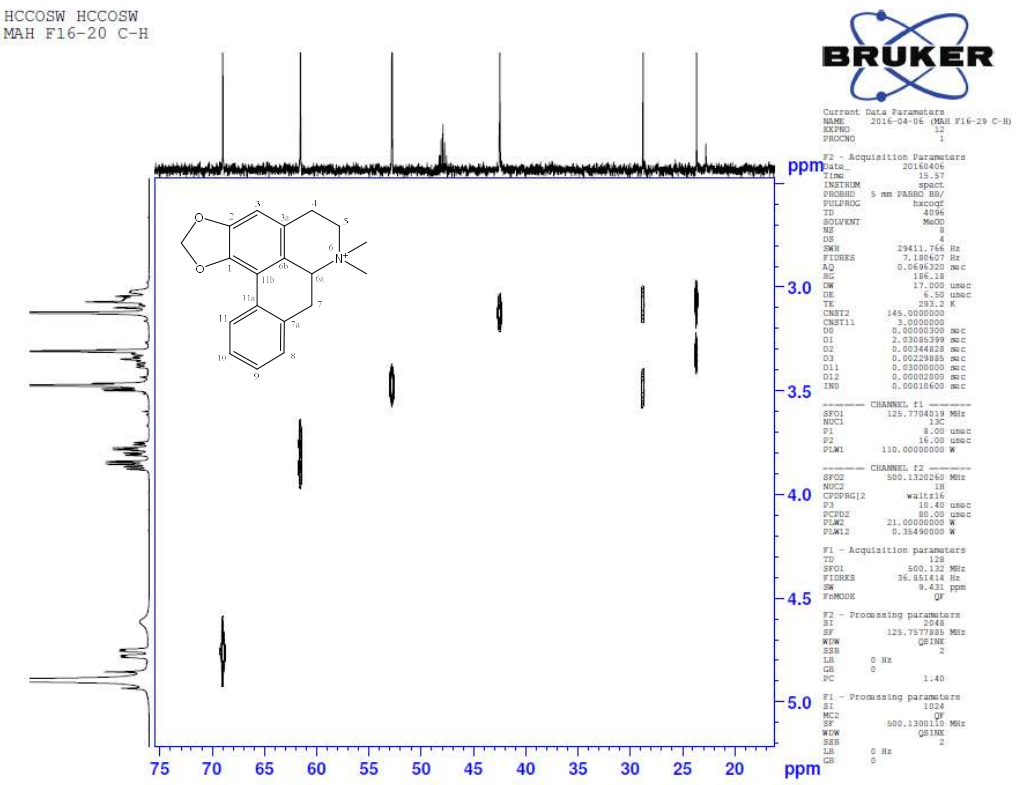
S80: DEPT (500 MHz) Spectrum of Compound **5** (remrefidine)



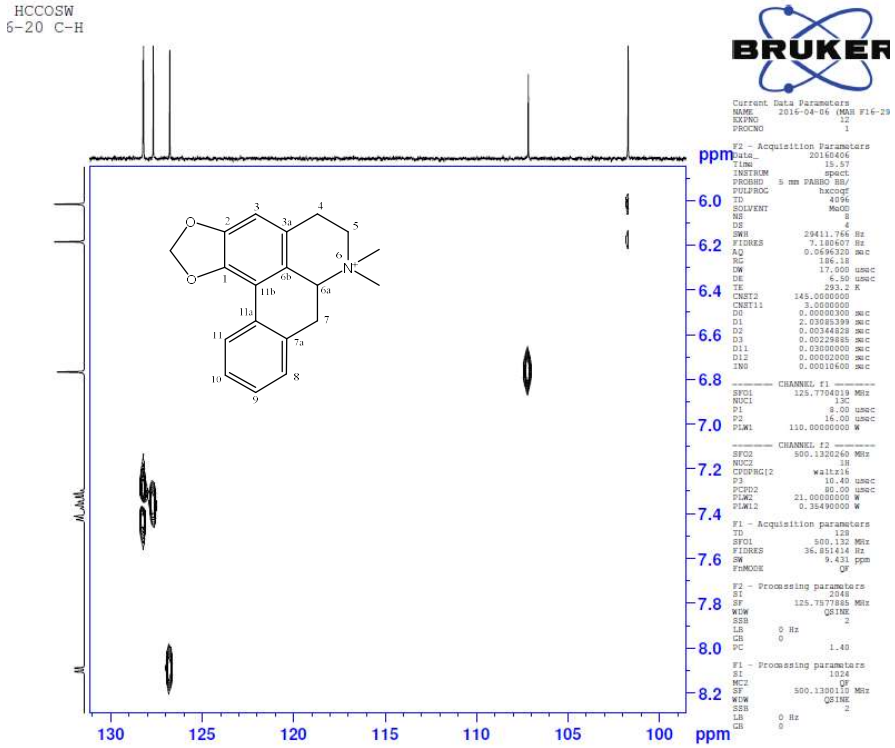
S81: Expansion of the DEPT (500 MHz) Spectrum of Compound **5** (remrefidine)



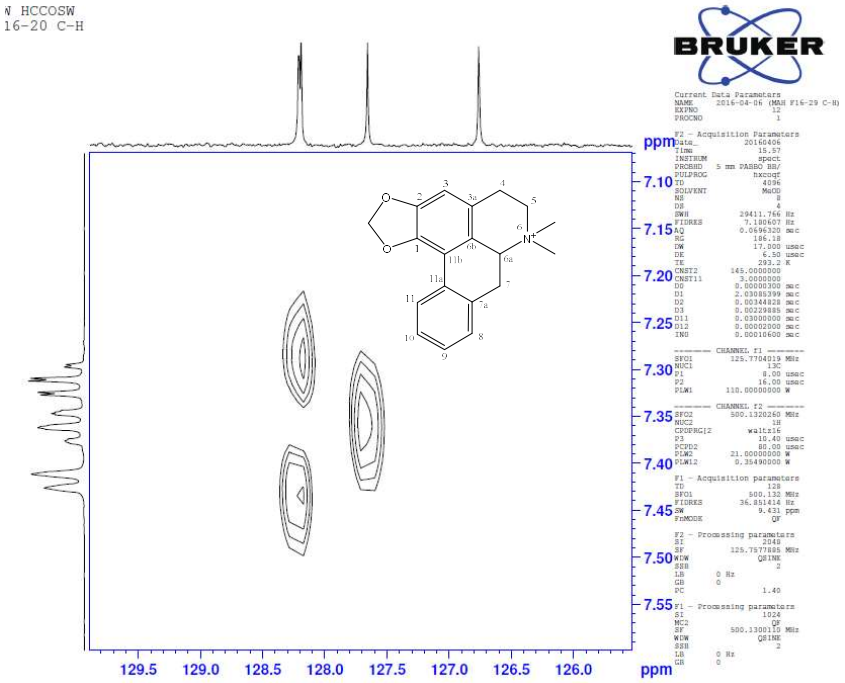
S82: HCCOW Spectrum of Compound **5** (remrefidine)



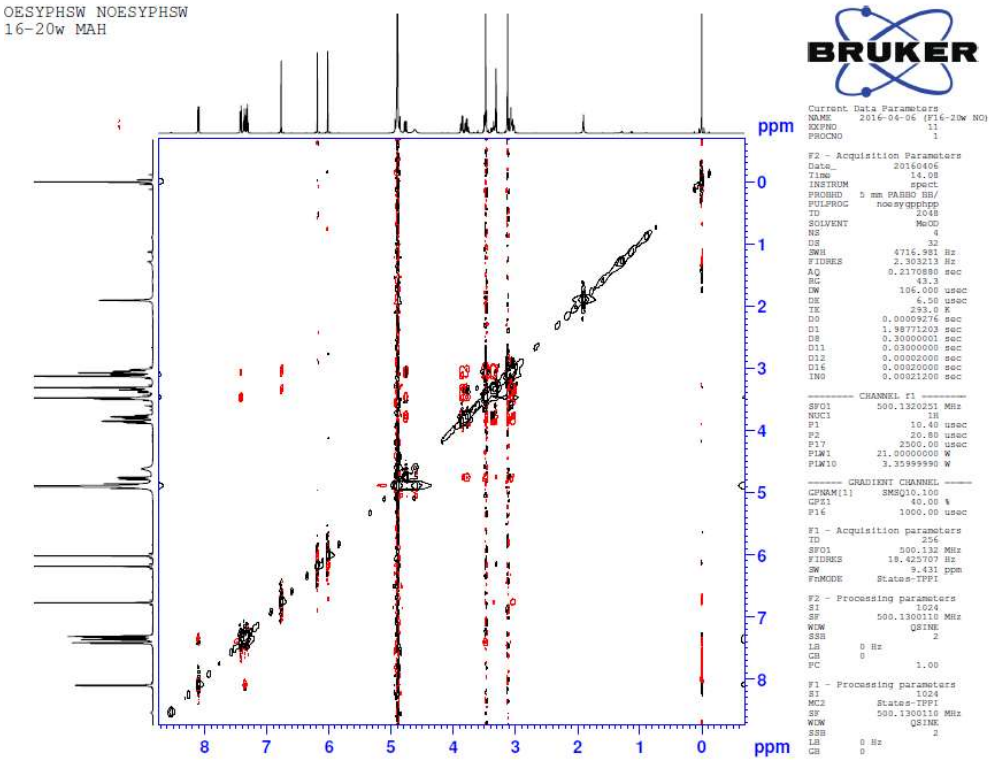
S83: Expansion of the HCCOW Spectrum of Compound **5** (remrefidine)



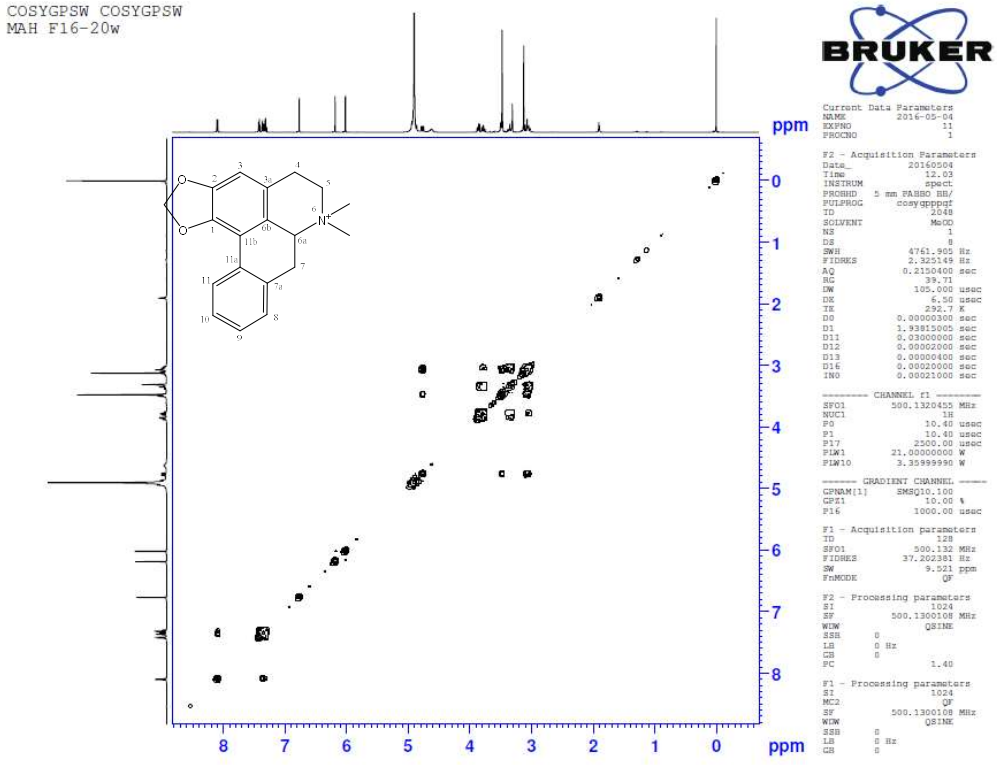
S84: Expansion of the HCCOW Spectrum of Compound **5** (remrefidine)



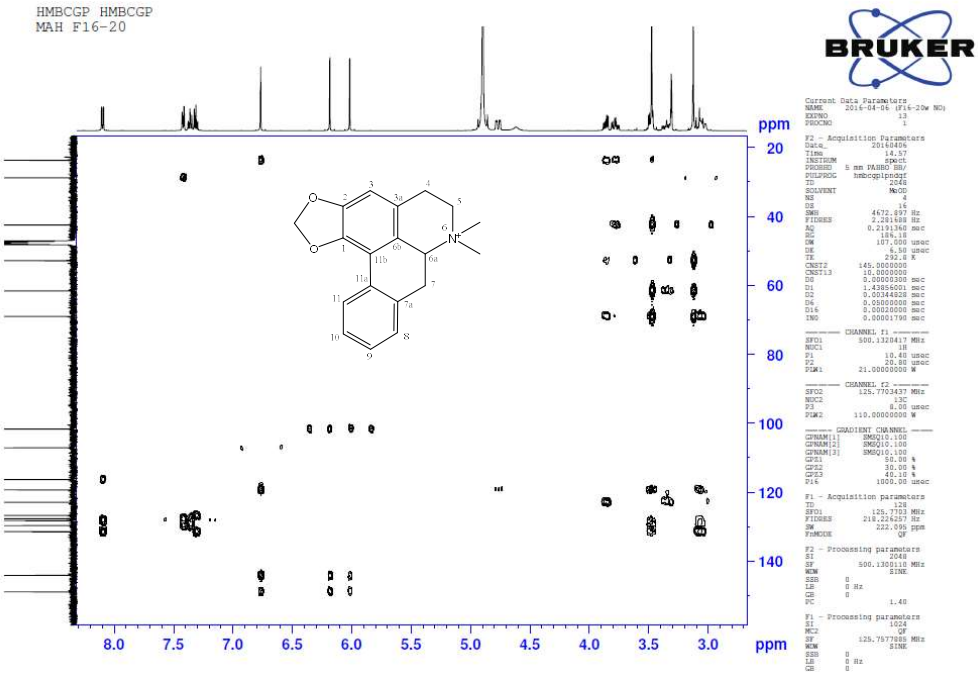
S85: Expansion of the HCCOW Spectrum of Compound **5** (remrefidine)



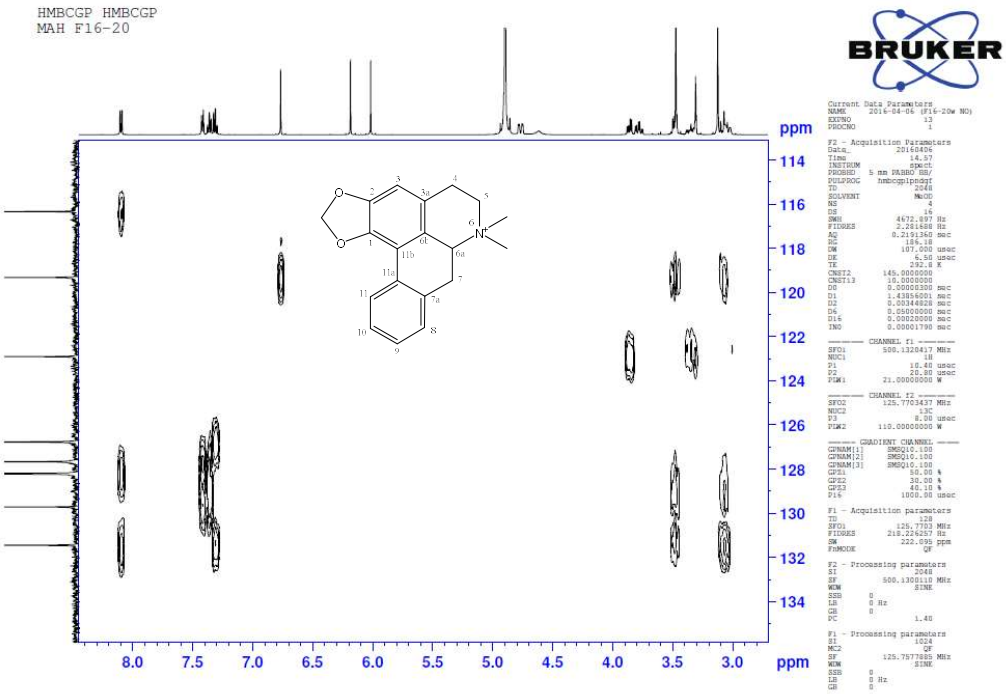
S86: NOSY (500 MHz) Spectrum of Compound **5** (remrefidine)



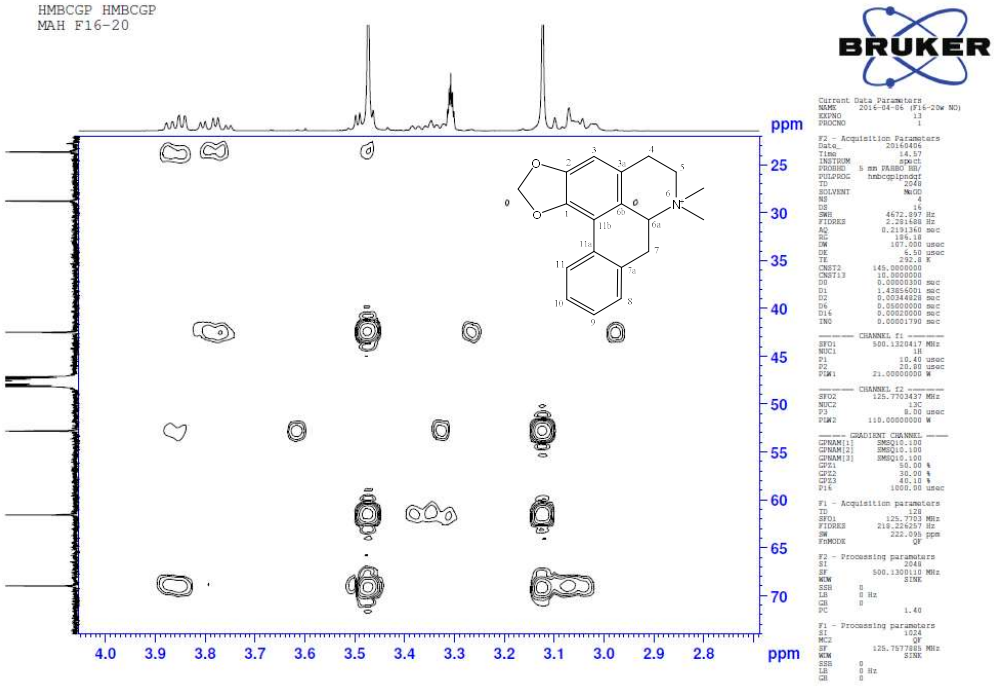
S87: COSY (500 MHz) Spectrum of Compound **5** (remrefidine)



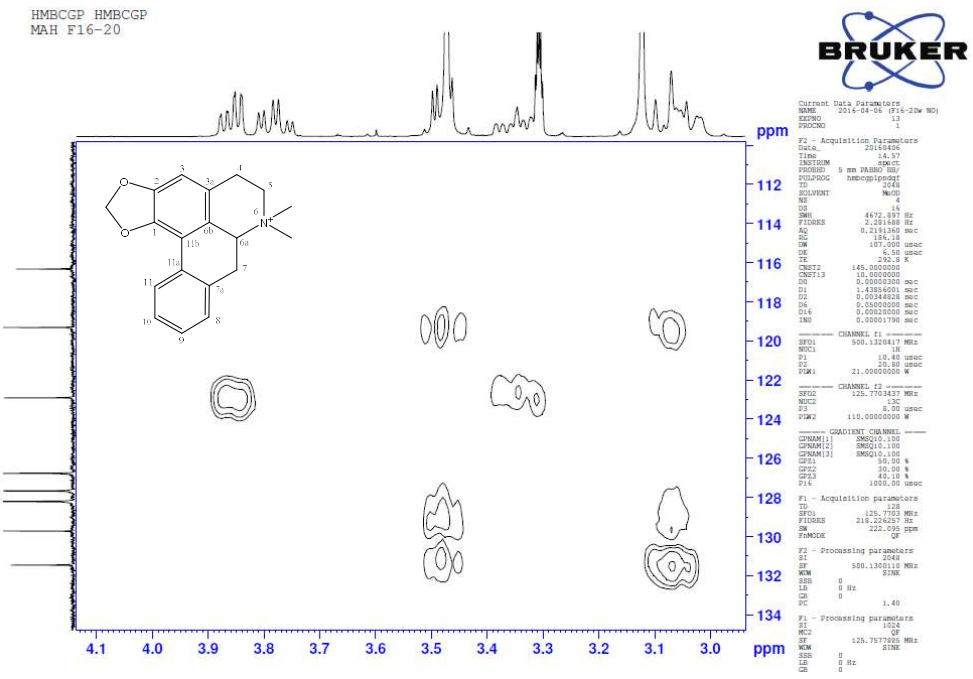
S88: HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **5** remrefidine)



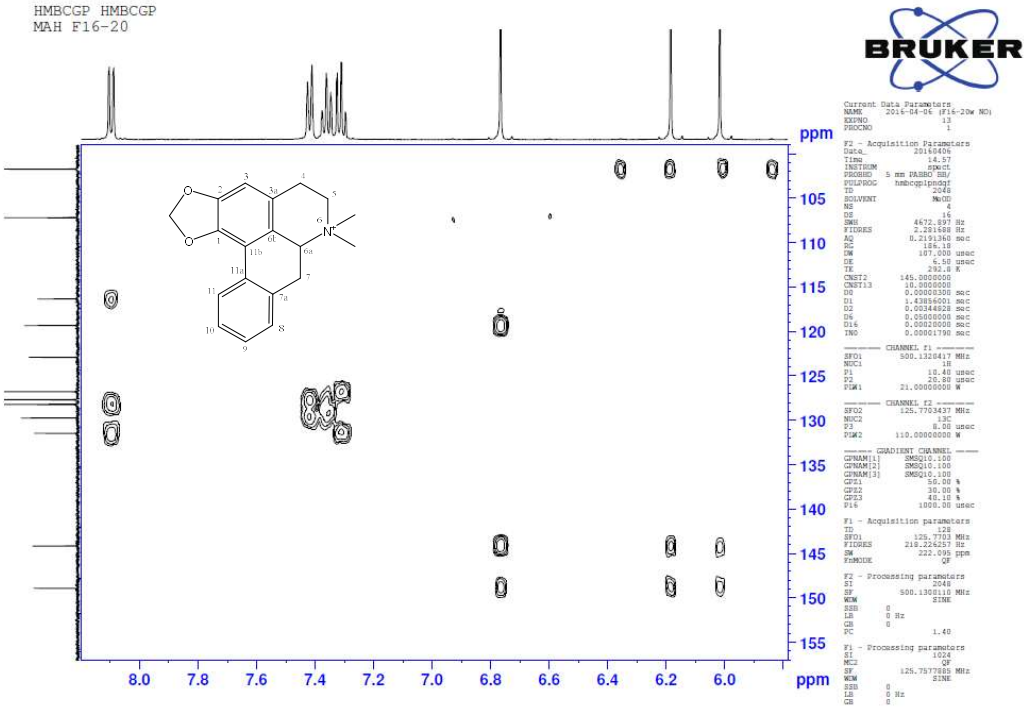
S89: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **5** (remrefidine)



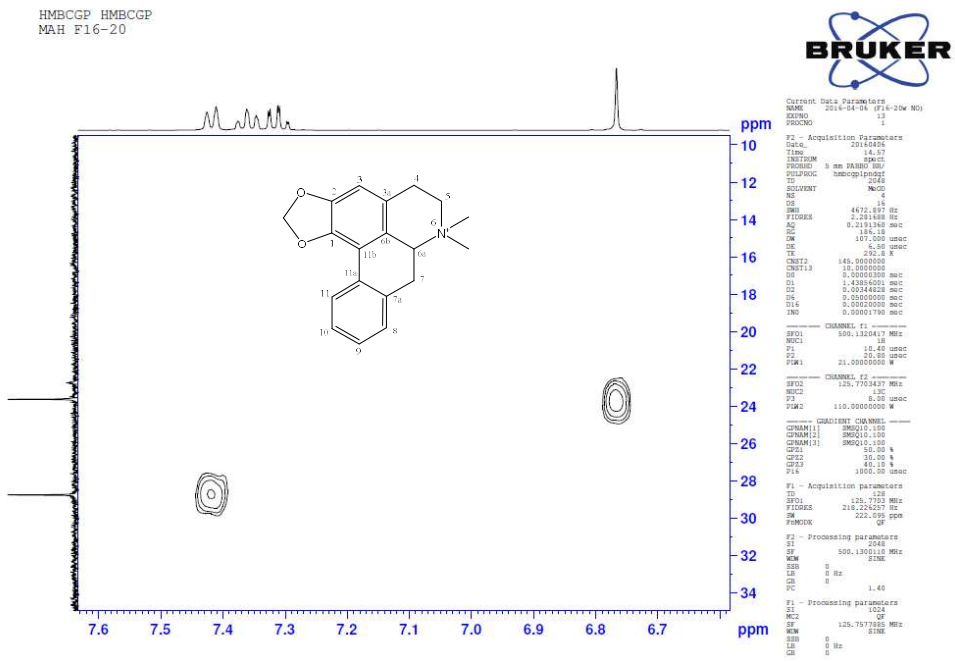
S90: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **5** (remrefidine)



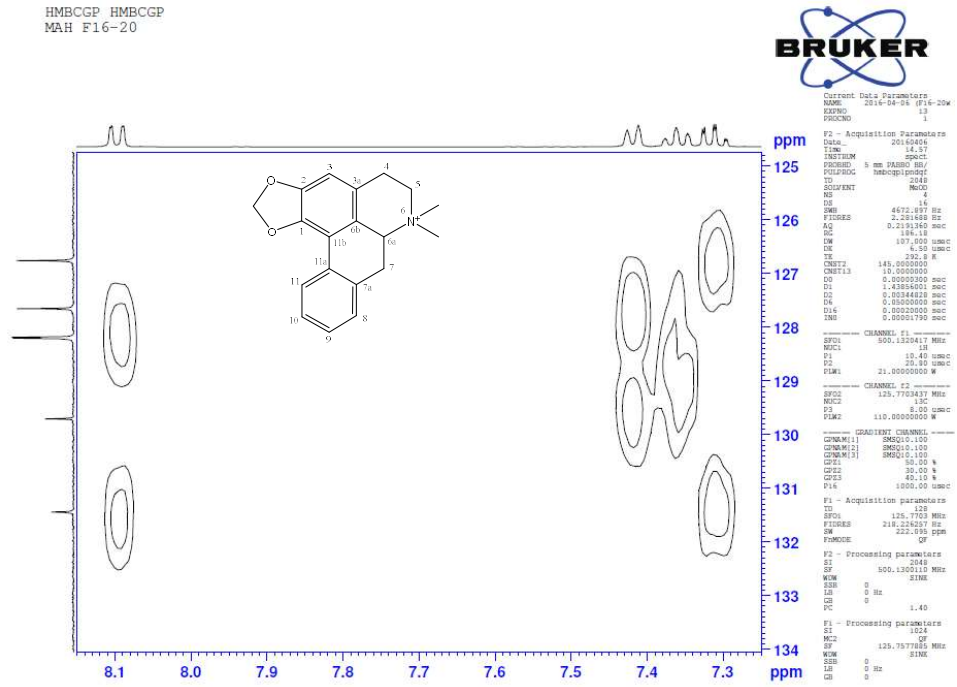
S91: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **5** (remrefidine)



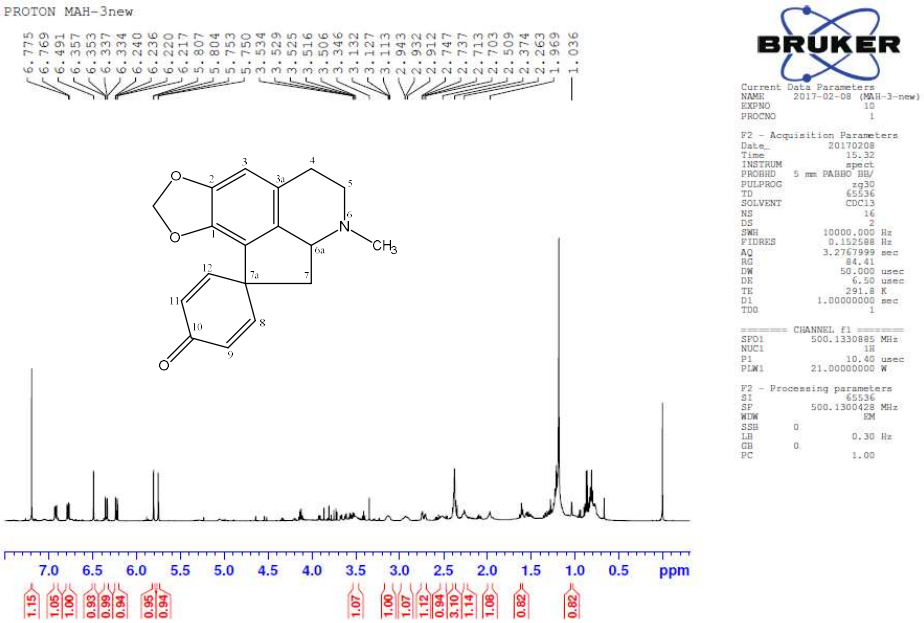
S92: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **5** (remrefidine)



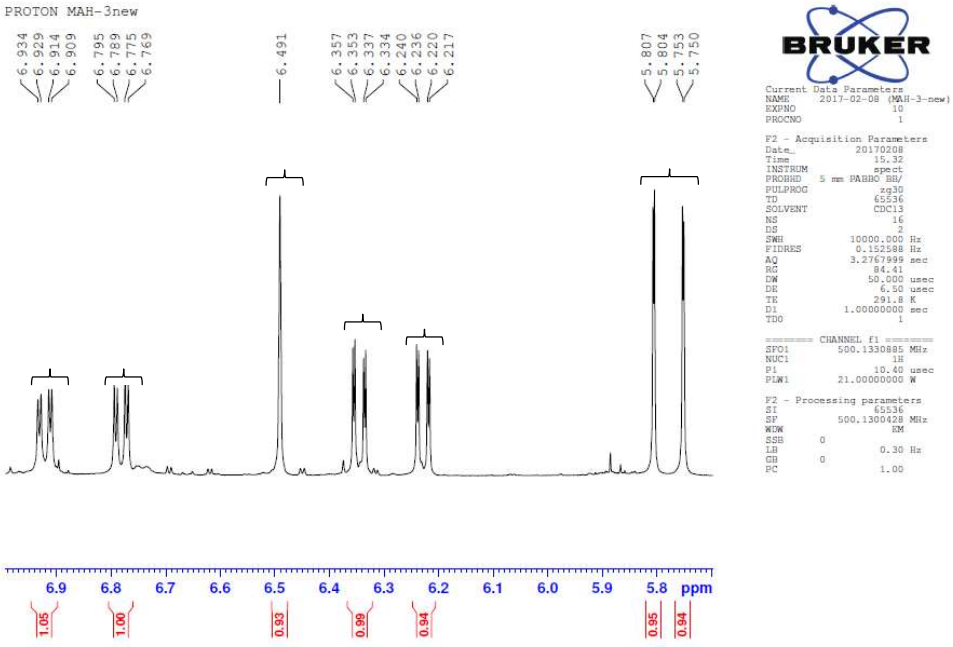
S93: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **5** (remrefidine)



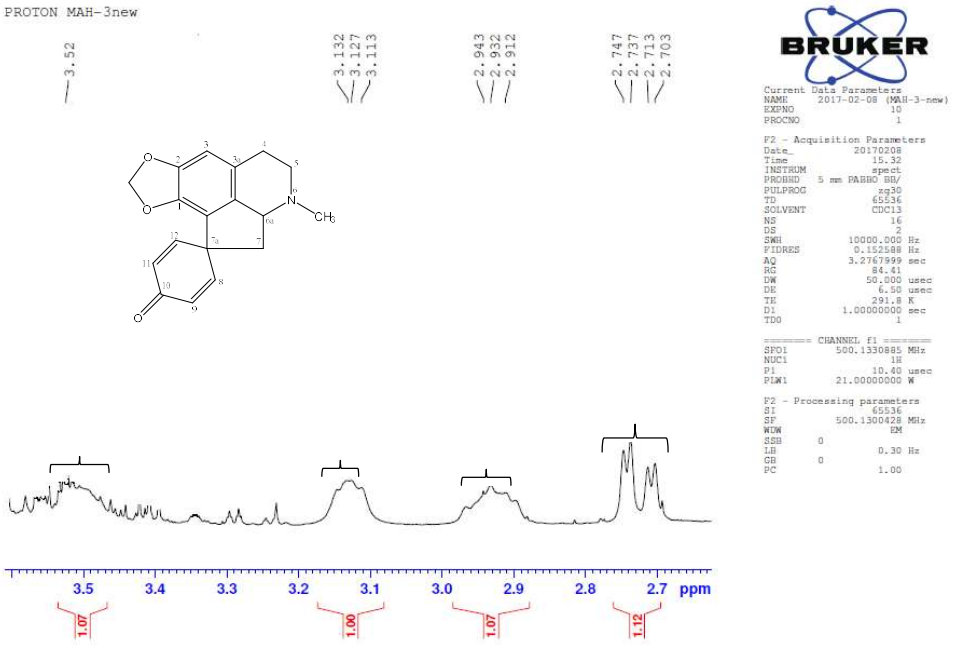
S94: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **5** (remrefidine)



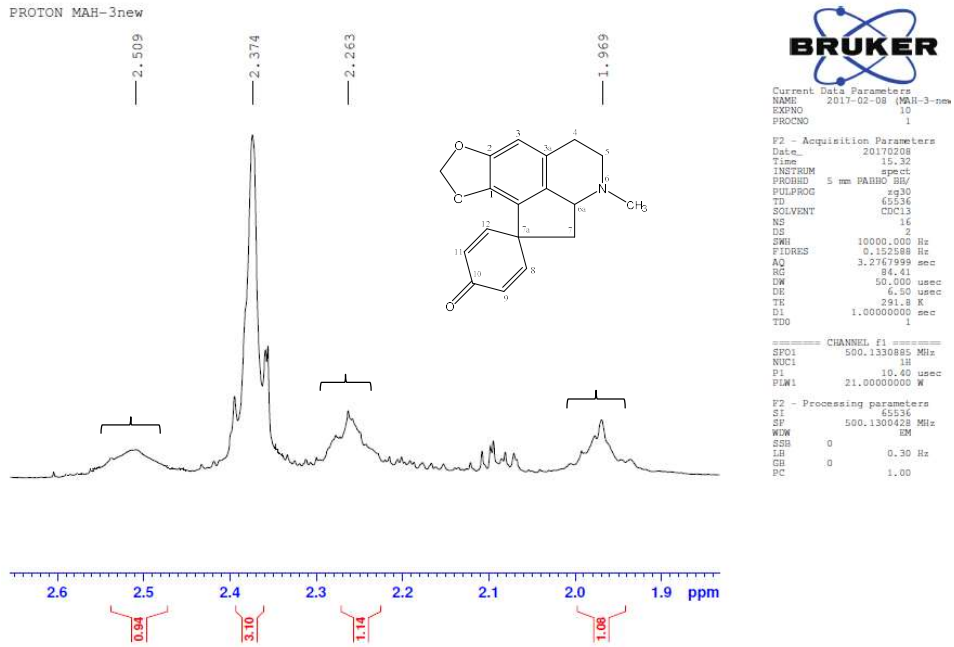
S95: ^{1}H-NMR (500 MHz, CD_3OD) Spectrum of Compound **6** (mecambrine)



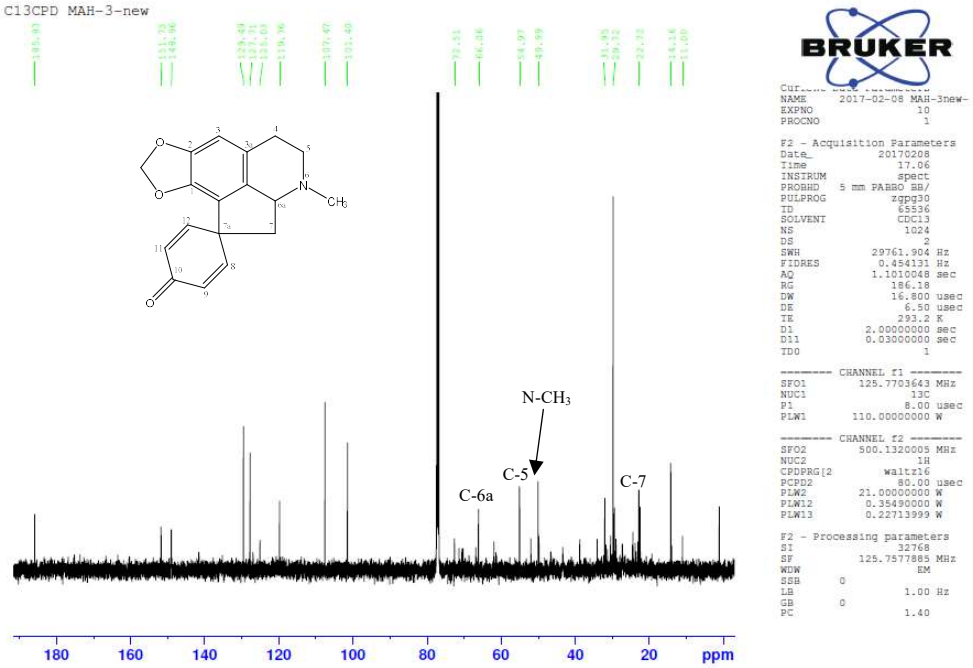
S96: Expansion of the ^{1}H-NMR (500 MHz) Spectrum of Compound **6** (mecambrine)



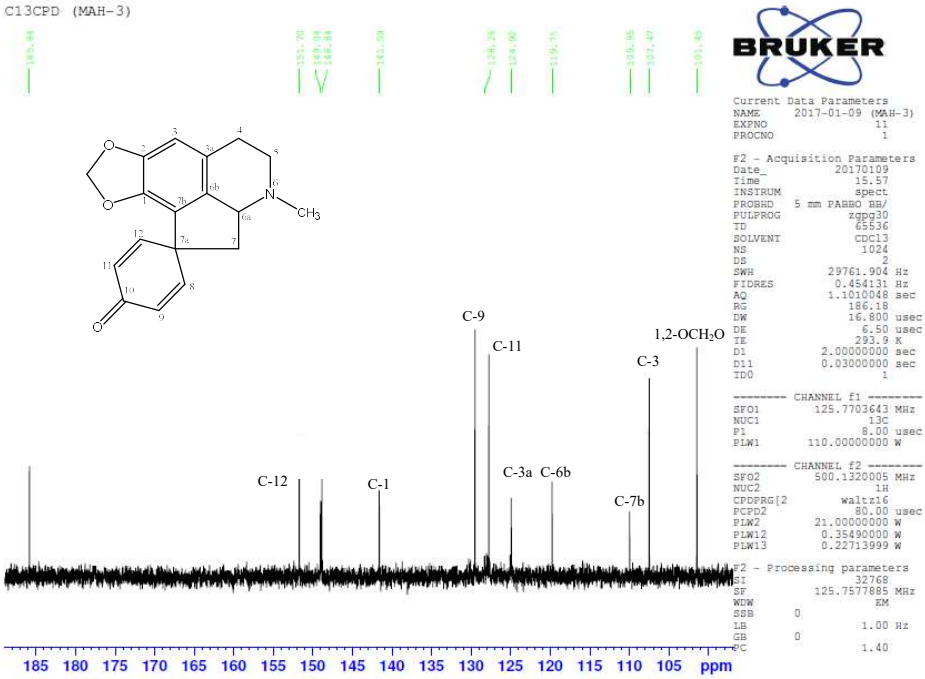
S97: Expansion of the ^{1}H-NMR (500 MHz) Spectrum of Compound **6** (mecambrine)



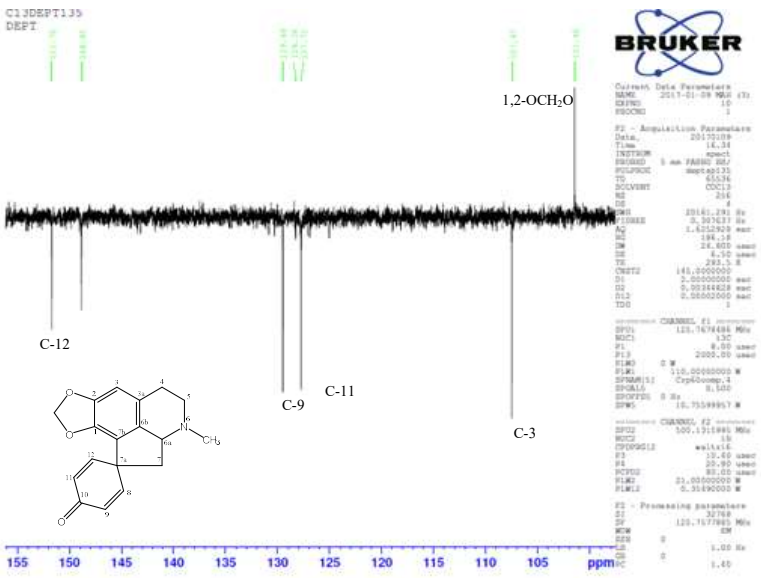
S98: Expansion of the ^{1}H-NMR (500 MHz) Spectrum of Compound **6** (mecambrine)



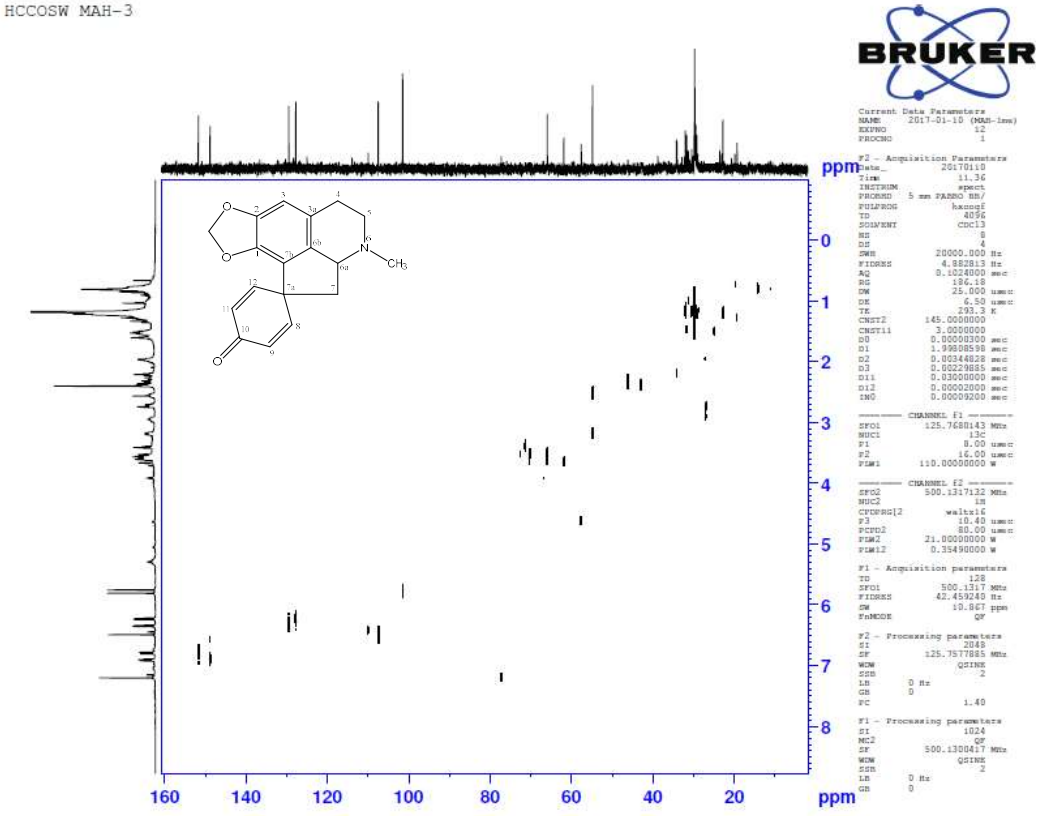
S99: ^{13}C-NMR (500 MHz) Spectrum of Compound **6** (mecambrine)



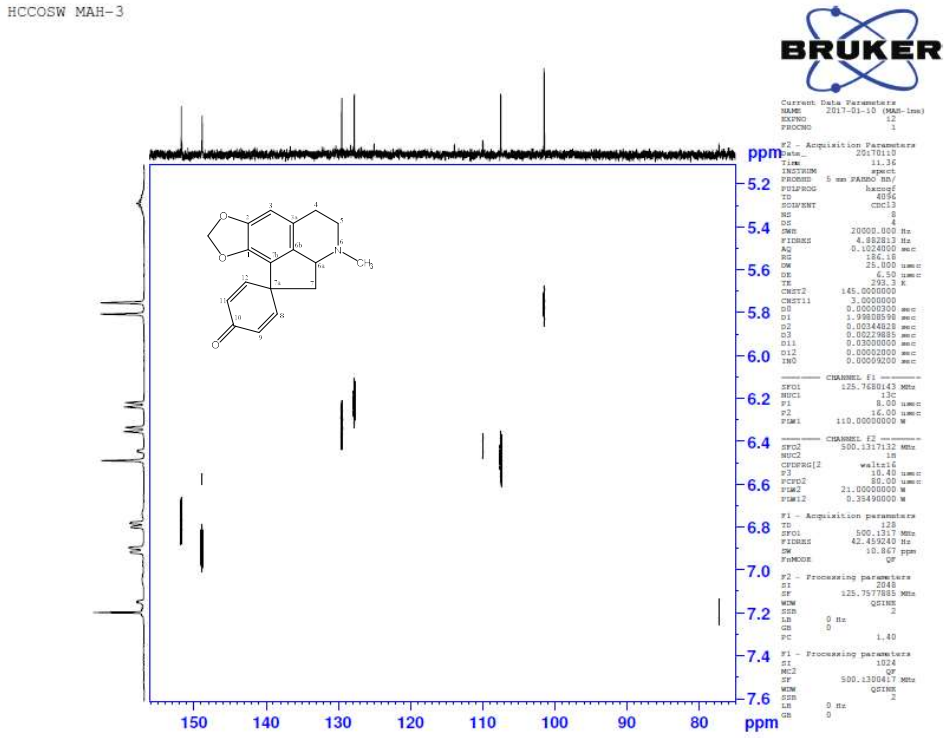
S100: Expansion of the ^{13}C-NMR (500 MHz) Spectrum of Compound **6** (mecambrine)



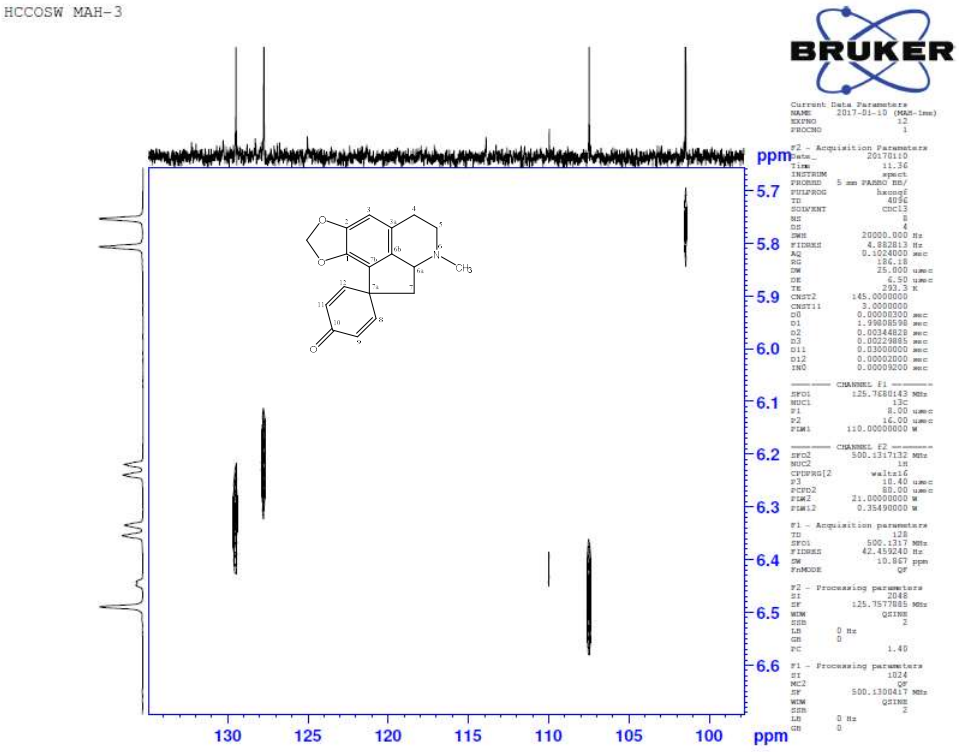
S101: DEPT (500 MHz) Spectrum of Compound **6** (mecambrine)



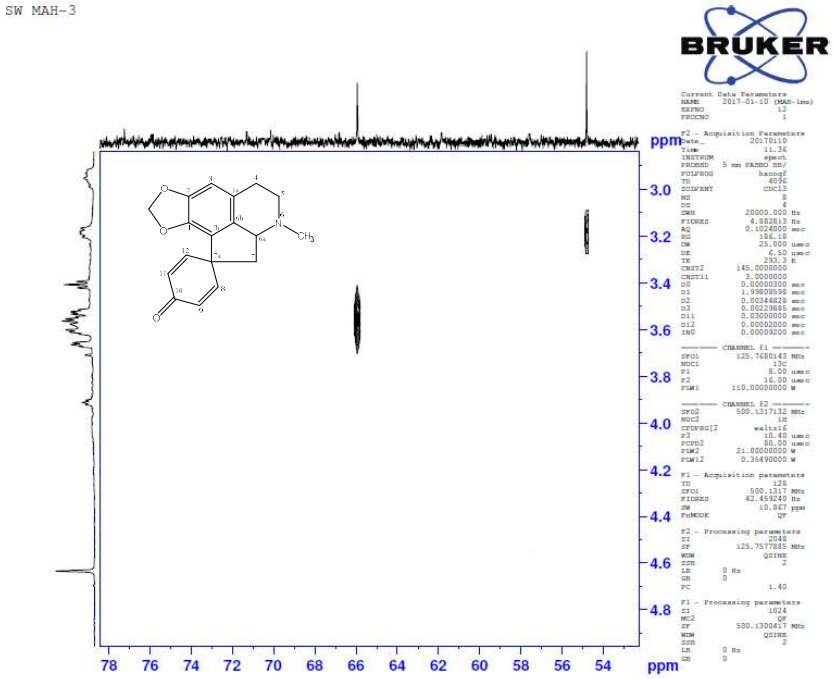
S102: HCCOW Spectrum of Compound **6** (mecambrine)



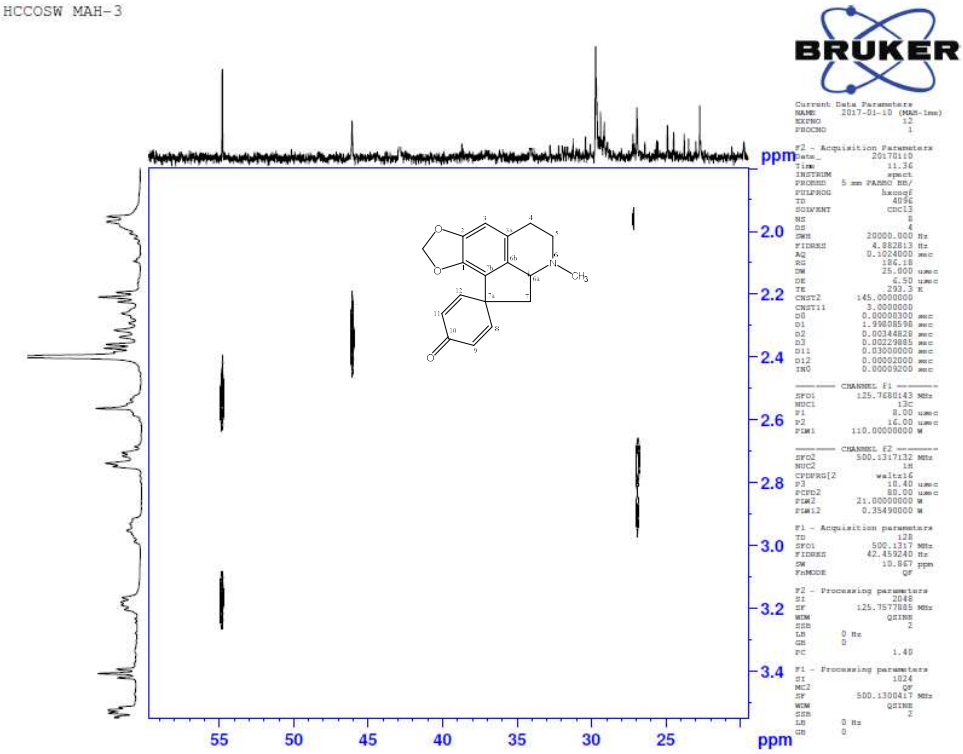
S103: Expansion of the HCCOW Spectrum of Compound **6** (mecambrine)



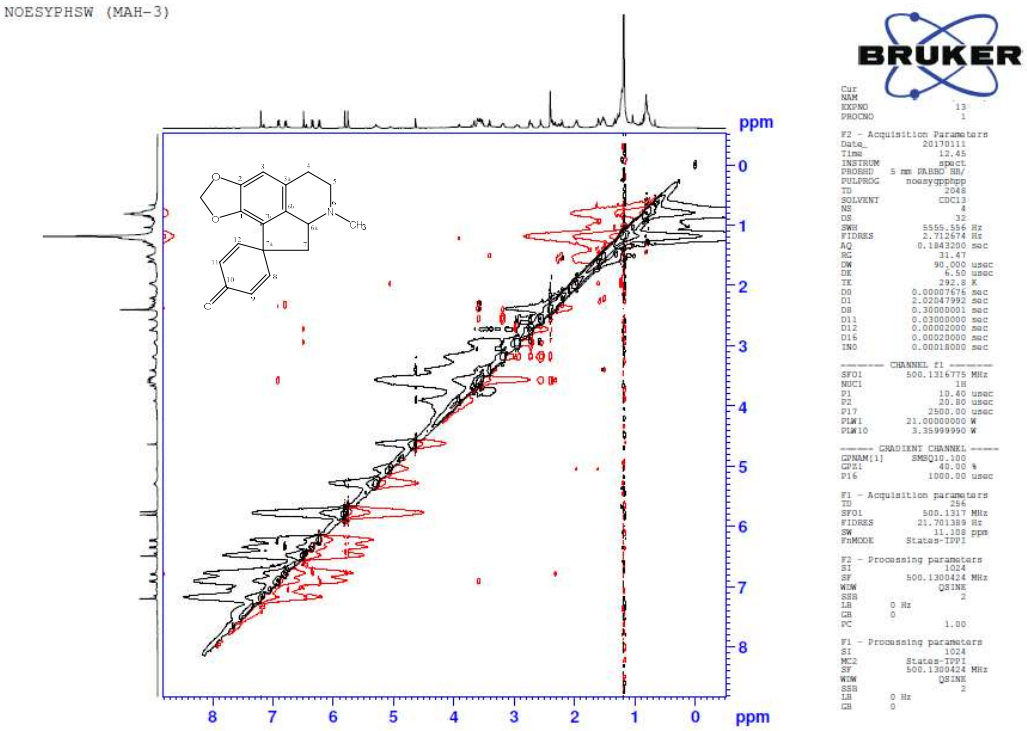
S104: Expansion of the HCCOW Spectrum of Compound **6** (mecambrine)



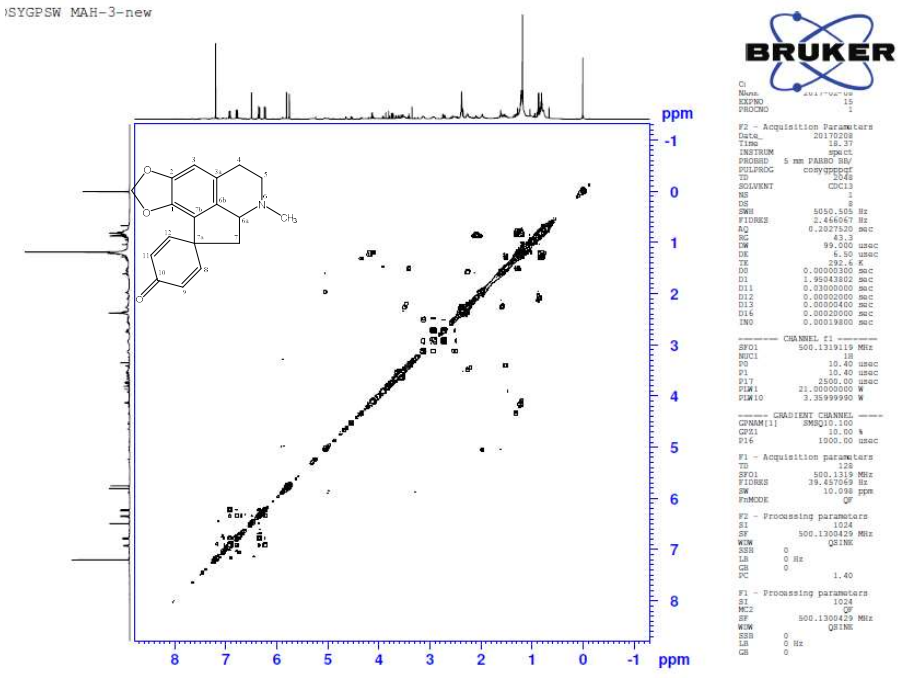
S105: Expansion of the HCCOW Spectrum of Compound **6** (mecambrine)



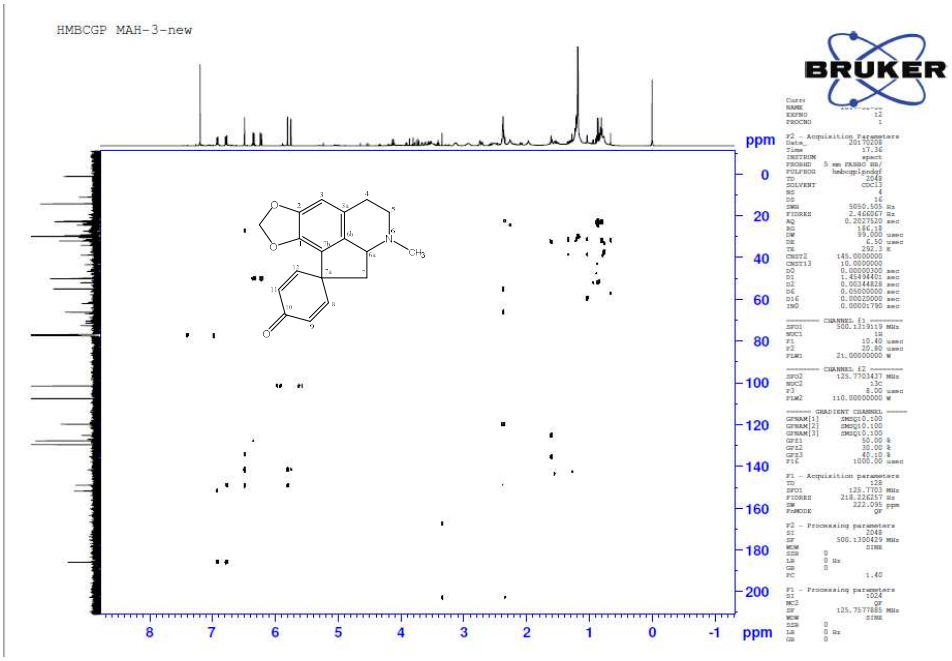
S106: Expansion of the HCCOW Spectrum of Compound **6** (mecambrine)



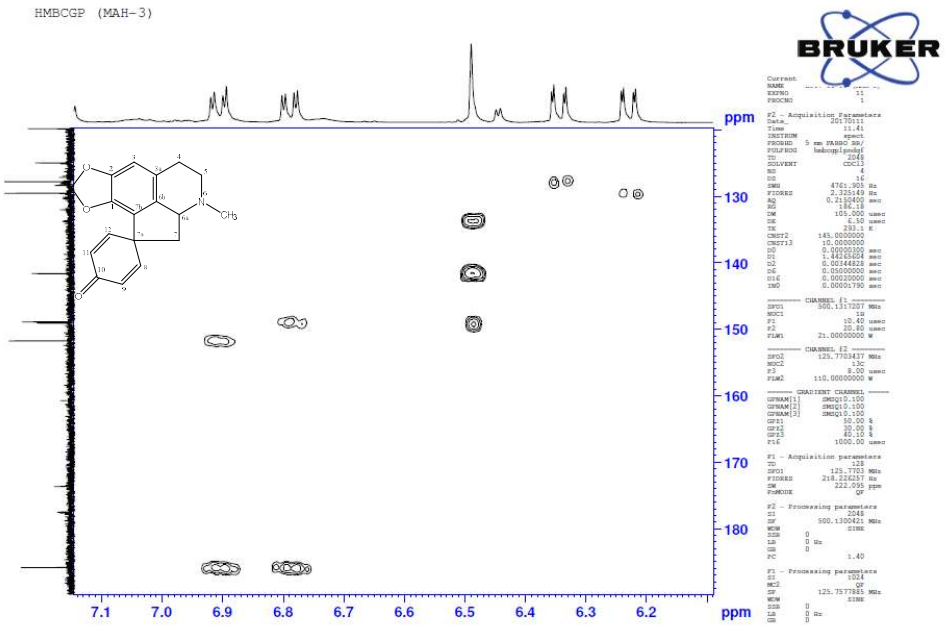
S107: NOSY (500 MHz) Spectrum of Compound **6** (mecambrine)



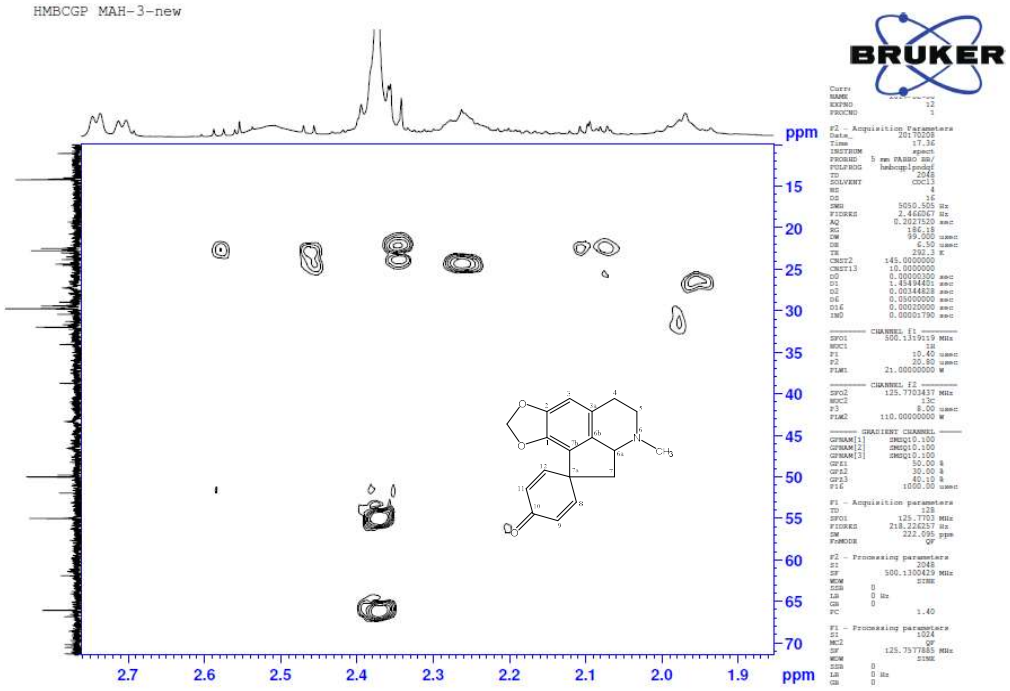
S108: COSY (500 MHz) Spectrum of Compound **6** (mecambrine)



S109: HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **6** (mecambrine)



S110: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **6** (mecambrine)



S111: Expansion of the HMBC (500 MHz, $CDCl_3$) Spectrum of Compound **6** (mecambrine)

S112: ^{1}H NMR (500MHZ) data of isolated compounds (CDCl3, δ in ppm, J in Hz)

Position (H)	Dehydro-remerine	Roemerine	Alborine	Remrefidine	Mecambrine
1-OCH_3	--	--	4.17 (3H, s)	--	--
1,2-OCH_2O	6.137 (2H, s)	6.01 (1H, d, *J*=1) 5.864 (1H, d, *J*=1)	--	6.18 (1H, d, *J*=1) 6.01 (1H, d, *J*=1)	5.8 (1H, d, *J*=1.5) 5.75 (1H, d, *J*=1.5)
3	6.86 (1H, s)	6.48 (1H, s)	--	6.76 (1H, s)	6.49 (1H, s)
4	3.16 (2H, t, *J*= 6)	~3.09 (1H, m) ~2.58 (1H, dd, *J*= 16, 3.5)	6.72 (1H, s)	~3.34 (1H, m) ~3.05 (1H, m)	~2.9 (1H, m) ~2.7 (1H, dd, *J*=17, 5)
5	3.28 (2H, t, *J*= 6)	~3.04 (1H, m) ~2.51 (1H, m)	3.17 (2H, t, *J*=6)	~3.86 (1H, ddd, *J*=12.5, 6, 1) ~3.78 (1H, dt, *J*=12.5, 5)	~2.5 (1H, m) ~3.12 (1H, m)
6	3.01 (3H, s)	2.51 (3H,s)	4.76 (2H, t, *J*=6)	3.47 (3H,s) 3.12 (3H, s)	2.37 (3H, s)
6a	--	3.19 (1H, br.d, *J*=14)	--	4.76 (1H, dd, *J*=14, 4)	3.52 (1H, m)
7	6.49 (1H, s)	~3.10 (1H, dd, *J*=18, 4.5) ~2.67 (1H, t, *J*= 14)	--	~3.48 (1H, dd, *J*=14, 4) ~3.06 (1H, m)	~2.2 (1H, m) ~1.96 (1H, m)
8	7.54 (1H, d, *J*=8)	7.19 (1H, m)	9.46 (1H, s)	7.48 (1H, br.d, *J*=7.5)	6.93 (1H, dd, *J*=10, 2.5)
9	7.37 (1H, dt, *J*= 1, 7)	7.24 (1H, t, *J*= 7)	7.7 (1H, d, *J*=15)	7.36 (1H, br.t, *J*=7.5)	6.35 (1H, dd, *J*=10, 2.5)
10	7.24 (1H, t, *J*= 7.5)	7.16 (1H, t, *J*= 7)	--	7.31 (1H, dt, *J*=7.5, 1.5)	--
11	8.82 (1H, d, *J*= 8.5)	7.99 (1H, d, *J*= 7.5)	--	8.09 (1H, dd, *J*=7.5, 1)	6.23 (1H, dd, *J*=10, 3)
12	--	--	--	--	6.79 (1H, dd, *J*=10, 3)

10-OCH_3	--	--	4.1 (3H, s)	--	--
11-OCH_3	--	--	4.07 (3H, s)	--	--
12-CH_2OH	--	--	5.11 (2H, s)	--	--
13	--	--	9.32 (1H, s)	--	--
2,3-OCH_2O	--	--	6.1 (2H, s)	--	--

S113: ^{13}C NMR (500MHz) data of isolated compounds (CDCl3, δ in ppm)

Position (C)	Dehydroremerine	Roemerine	Alborine	Remrefidine	Mecambrine
1	142.15 (C)	142.73 (C)	142.15 (C)	144.14 (C)	141.59 (C)
1a	--	--	--	--	109.9 (C)
1b	--	--	--	--	119.75 (C)
2	145.12 (C)	146.89 (C)	137.04 (C)	148.9 (C)	149.05 (C)
3	107.43 (CH)	107.49 (CH)	151.94 (C)	107.15 (CH)	107.47 (CH)
3a	127.49 (C)	126.43 (C)	--	122.9 (C)	124.9 (C)
4	30.9 (CH_2)	28.72 (CH)	102.86 (CH)	23.63 (CH)	27.72 (CH)
4a	--	--	132.8 (C)	--	--
5	50.42 (CH_2)	53.41 (CH_2)	27.84 (CH_2)	61.54 (CH_2)	54.8 (CH_2)
6	40.4 (N-CH_3)	43.42 (N-CH_3)	55.35 (CH_2)	52.78 (N-CH_3) 42.77 (N-CH_3)	49.9 (N-CH_3)
6a	127.41 (C)	61.98 (CH)	--	68.97 (CH)	65.9 (CH)
6b	119.07 (C)	126.24 (C)	--	119.3 (C)	
7	101.15 (CH)	34.34 (CH_2)	--	28.76 (CH_2)	22.7 (CH_2)
7a	134.15 (C)	135.07 (C)	--	129.7 (C)	46.1 (C)
8	125.83 (CH)	128.24 (CH)	145.75 (CH)	128.19 (CH)	149.96 (CH)
8a	--	--	124.3 (C)	--	--
9	126.98 (CH)	127.12 (CH)	107.25 (CH)	127.66 (CH)	129.6 (CH)
10	122.41 (CH)	127.59 (CH)	155.73 (C)	128.21 (CH)	185.8 (CO)
11	126.84 (CH)	126.91 (CH)	156.03 (C)	126.76 (CH)	128.26 (CH)
11a	124.02 (C)	131.01 (C)	--	131.45 (C)	--
11b	117.33 (C)	116.46 (C)	--	116.32 (C)	--
12	--	--	128.19 (C)	--	151.73 (CH)

12a	--	--	135.43 (C)	--	--
13	--	--	121.4 (CH)	--	--
13a	--	--	136.13 (C)	--	--
13b	--	--	112.9 (C)	--	--
1, 2-OCH_2O	100.98 (CH_2)	101.81 (CH_2)	--	101.69 (CH_2)	101.4 (CH_2)
2, 3-OCH_2O	--	--	102.26 (CH_2)	--	--
1-OCH_3	--	--	59.47 (C)	--	--
10-OCH_3	--	--	55.6 (C)	--	--
11-OCH_3	--	--	61.39 (C)	--	--
12-CH_2OH	--	--	53.88 (C)	--	--