Table 1. The ^{13}C-NMR and APT spectra of 2 indicated the presence of a carbonyl, five quaternary carbons, eight methines, four methylenes and three methyls. The HETCOR and selective INEPT [3] spectra of 2 permitted the unambiguous assignment of the ^{13}C-NMR signals of 2 as shown in Table 1.

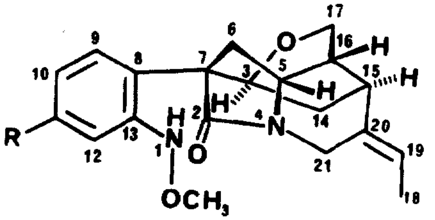
Table 1. ^{1}H- and ^{13}C-NMR Chemical Shifts Assignments of 1 and 2^a

	1	2	1	2
Carbon	^{1}H	^{1}H	^{13}C	^{13}C
2	----	----	181.59	181.80
3	4.73 (m)	4.68 (m)	79.47	79.69
5	3.99 (dd, 6.0, 9.3)	3.97 (dd, 5.2, 9.3)	54.06	54.69
6α	2.47 (m)	2.43 (m)	32.79	32.68
6β	1.86 (m)	1.86 (m)		
7	----	----	61.06	60.49
8	----	----	124.81	117.28
9	7.28 (dd, 1.5, 8.1)	7.06 (d, 7.8)	113.56	99.64
10	6.87 (dt, 1.5, 8.1)	6.38 (dd, 1.8, 7.8)	120.43	105.03
11	7.24 (dt, 1.5, 8.1)	----	128.36	160.04
12	7.17 (dd, 1.5, 8.1)	6.87 (d, 1.8)	127.17	128.24
13	----	----	147.59	148.98
14α	2.58 (d, 12)	2.55 (d, 12.3)	31.50	31.56
14β	2.37 (dd, 4.5, 12)	2.31 (dd, 5.4, 12.3)		
15	2.25 (m)	2.25 (m)	36.59	36.51
16	2.48 (m)	2.49 (m)	37.24	37.22
17α	4.20 (dd, 1.8, 9.6)	4.19 (dd, 2.7, 10.5)	68.17	68.18
17β	3.86 (dd, 1.8, 9.6)	3.85 (dd, 2.7, 10.5)		
18	1.57 (d, 6.9)	1.56 (d, 6.9)	12.72	12.68
19	5.35 (q, 6.9)	5.35 (q, 6.9)	119.18	119.12
20α	----	----	140.66	140.69
21β	4.76 (dd, 2.4, 12.3)	4.76 (d, 15.6)	42.14	42.06
21	3.53 (dd, 2.4, 12.6)	3.51(dd, 3.3, 15.6)		
NOMe	3.56 (s)	3.51 (s)	2.11	62.19
Ar-OMe	----	3.80 (s)	----	55.18
N-H	9.61 (s)	9.68 (s)	----	----

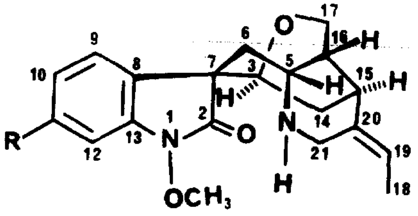
a: Recorded in CDCl$_3$, chemical shift values are reported as values (ppm) from internal TMS at 300 MHz, signal multiplicity and coupling constants (Hz) are shown in parentheses.

The presence of an NOE between H_{18} (δ 1.56) and $H_{21\alpha}$ (δ 4.76) or $H_{21\beta}$ (δ 3.53) distinguished the H_{21} signals from those of H_{17} (δ 4.19, 3.85), which are unusually upfield from H_{21} and also established the Z-configuration for the 19,20-double bond. Similarly, the nOe enhancements of H_6 and H_{16} on the irradiation of H_5 and H_{17}, respectively, permitted the assignment of those protons, the signals of which are close to several other proton resonances. Magnetization transfer [3,5] via irradiation of H_9 (δ 7.06) resulted in enhancement to carbons at δ 147.98, 160.04 and 60.49, which could be assigned as C_{13}, C_{11} and C_7, respectively. Similarly, irradiation of H_{12} (δ 6.87) enhanced the aromatic quaternary carbon at δ 117.28 which should be C_8, and the aromatic tertiary càrbon at δ 128.24 which is C_{10}.

The molecular ion of gelsemamide (1) at m/z 340 ($C_{20}H_{24}N_2O_4$) was 30 amu less than that of 2. Furthermore, 1 showed nearly identical characteristics (UV, MS, CD, ^{1}H-and ^{13}C-NMR) as 2, except that 1 has no aromatic methoxy group at C_{11}, therefore, 1 should be the parent compound of 2. The ^{1}H-NMR, COSY, ^{13}C-NMR, CSCM 1D [4,5] results of 1 led to assignments for the ^{1}H and ^{13}C signals as shown in Table 1.



1 R=H
2 R=OCH₃



3 R=H
4 R=OCH₃

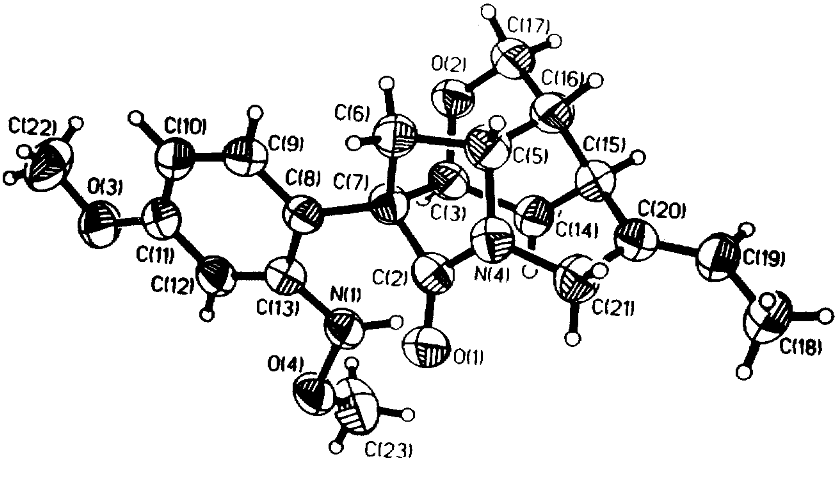


Figure 1. Molecular structure for 2.