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# A Novel Alkaloid from *Stemona parviflora*

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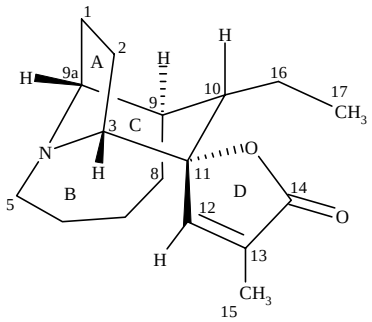
**Abstract:** A novel alkaloid was isolated from the stems and leaves of *Stemona parviflora* Wright. Based on the spectral methods, its structure was elucidated as parvineostemonine.

**Keywords:** *Stemona parviflora*, perhydroazaazulene, parvineostemonine.

*Stemona parviflora* is a traditional Chinese medicine widely distributed in China, which has been used as an anticough agent and insecticide for a long time[1]. Many early studies have depicted that alkaloids which have a unique basic skeleton were main effective constituents. In this paper we investigated the stems and leaves of *Stemona parviflora* which was collected in Hainan province. A novel alkaloid parvineostemonine was isolated and its structure was determined as **1** by UV, IR, HREIMS, 1D and 2D- NMR spectra.

**Figure 1** Structure of **1**




Parvineostemonine **1**, light yellow amorphous, had a positive reaction with Dragendorff regent. EIMS suggested its molecular weight as 275 and HREIMS further displayed its molecular formula as $C_{17}H_{25}NO_2$ (*m/z* 275.1893, calcd. 275.1885) with 6 unsaturated degrees. In EIMS the characteristic base peak at *m/z* 137 indicated that its

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molecular structure contained a perhydroazaazulene skeleton[2]. Another ion peak at *m/z* 246 $[M-29]^+$ suggested the presence of an ethyl group. The UV absorption at 235 nm was indicative of parvistemonine-type alkaloids[4]. The IR absorption at 1735, 1458, 1248 $cm^{-1}$ indicated that **1** contained an α-methyl-γ-unsaturated lactone. The $^1$H-NMR spectrum of **1** in $CDCl_3$ showed a triplet (3H) at δ 0.80 ($J$ = 7.4 Hz) for the $CH_3$-17 which belonged to the ethyl group and a doublet (3H) at δ 1.92 ($J$ = 1.4 Hz) for the $CH_3$-15. The quaternary carbon signals of C-11 (δ 89.6), C-13 (δ 130.6), C-14 (δ 174.2) further confirmed that **1** contained an α-methyl-γ-unsaturated lactone. In $^1$H-$^1$H COSY spectrum, the relationship of the saturated proton signals of ring A and ring B were very evident. The proton signals of ring A can be started to assign from H-9a (δ 3.72, bd, $J$ = 6.9Hz) by the correlations between H-9a / H-1 / H-2 / H-3. From the characteristic geminal protons of $H_2$-5 (α, δ 3.12, m; β, δ 3.61, m), the proton signals of ring B can be assigned by correlations between H-5 / H-6 / H-7 / H-8 / H-9. In HMBC spectrum, the $J^{3}$ correlations between C-11 and H-2, H-9 suggested ring D was annexed to ring C at C-11 and formed a spiro-ring. The correlation between C-10 and Me-17 indicated that the ethyl group was attached to C-10. All of other $^1$H-NMR, $^{13}$C-NMR, $^1$H-$^1$H COSY, HMQC and HMBC spectral data assignments of **1** (see **Table 1**) are coincident with the structure of parvineostemonine as **1**. The relative configuration of **1** was determined by NOESY spectrum. (see **Figure 2**)

**Figure 2** NOESY correlation of **1**

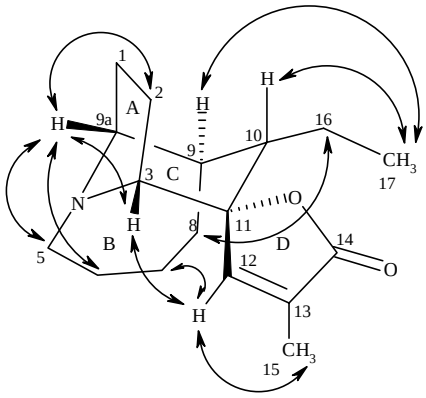

**Table 1** NMR data and major correlation from HMBC of **1** (in $CDCl_3$)

| Position | $^1$H-NMR (δ ppm, *J* Hz) | $^{13}$C-NMR | HMBC (carbon) |
|---|---|---|---|
| 1 | 1.55, m; 2.06, m | 28.2 (t) | |
| 2 | 1.67, m; 1.94, m | 27.1 (t) | 11 |
| 3 | 2.97, bd (*J* = 6.9) | 66.2 (d) | 1, 5, 9a, 10 |
| 5 | 3.12, m; 3.61, m | 46.6 (t) | 3, 7, 9a, |
| 6 | 1.75, m; 1.89, m | 28.3 (t) | 8 |
| 7 | 1.71, m; 2.02, m | 24.2 (t) | 5, 9 |
| 8 | 1.34, m; 1.87, m | 27.3 (t) | 6, 9a |
| 9 | 1.81, m | 38.4 (d) | 7, 9a, |
| 9a | 3.72, bd (*J* = 6.9) | 57.0 (d) | 2, 3, 5, 8, 10, |
| 10 | 1.98, m | 38.1 (d) | 3, 8, 17 |
| 11 | ----- | 89.6 (s) | |
| 12 | 6.88, d (*J* = 1.4) | 153.0 (d) | 14, 15 |
| 13 | ----- | 130.6 (s) | |
| 14 | ----- | 174.2 (s) | |
| 15-Me | 1.92, d (*J* = 1.4) | 10.7 (q) | 12, 14 |
| 16 | 1.01, m; 1.26, m | 17.2 (t) | |
| 17-Me | 0.80, t (*J* = 7.4) | 11.9 (q) | 10 |

The assignment was based on DEPT, $^1$H-$^1$H COSY, HMQC and HMBC experiments. 400MHz for $^1$H-NMR, 100MHz for $^{13}$C-NMR, HMQC, HMBC.

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