Supporting Information


Four New Cycloheximide Derivatives from *Streptomyces* sp.

*h-119*

Dou Yang¹,²,³, Qing Yan Xu¹,²,³, Xian Ming Deng¹,²,³, Si Yang Son¹,²,³,

Zhi Yu Hu¹,²,³ and Zhong Hui Zheng¹,²,³ *

¹ State Key Laboratory of Cellular Stress Biology, School of Life Sciences, Xiamen University,

Xiamen, Fujian 361102, China

² State-Province Joint Engineering Laboratory of Targeted Drugs from Natural Products,

Xiamen University, Xiamen, Fujian, 361102, China

³ School of Life Sciences, Xiamen University, Xiamen, Fujian 361102, China

Table of Contents

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1: HRESI-MS Spectrum of Compound 1</td>
<td>3</td>
</tr>
<tr>
<td>S2: ¹H-NMR (600 MHz, CDCl₃) Spectrum of Compound 1</td>
<td>4</td>
</tr>
<tr>
<td>S3: Expansion of the ¹H-NMR Spectrum of Compound 1</td>
<td>5</td>
</tr>
<tr>
<td>S4: Expansion of the ¹H-NMR Spectrum of Compound 1</td>
<td>6</td>
</tr>
<tr>
<td>S5: ¹³C-NMR and DEPT (600 MHz, CDCl₃) Spectrum of Compound 1</td>
<td>7</td>
</tr>
<tr>
<td>S6: Expansion of the ¹³C-NMR and DEPT Spectrum of Compound 1</td>
<td>8</td>
</tr>
<tr>
<td>S7: HSQC Spectrum (600MHz, CDCl₃) of Compound 1</td>
<td>9</td>
</tr>
<tr>
<td>S8: Expansion of the HSQC Spectrum of Compound 1</td>
<td>10</td>
</tr>
<tr>
<td>S9: HMBC Spectrum (600MHz, CDCl₃) of Compound 1</td>
<td>11</td>
</tr>
</tbody>
</table>

*Corresponding author: E-Mail: E-Mail: zzheng@xmu.edu.cn; Tel./Fax: 086-592-2181722
S10: Expansion of the HMBC Spectrum of Compound 1
S11: $^1$H-$^1$H COSY Spectrum (600MHz, CDCl$_3$) of Compound 1
S12: Expansion of the $^1$H-$^1$H COSY Spectrum of Compound 1
S13: NOESY spectrum (600MHz, CDCl$_3$) of compound 1
S14: HRESI-MS Spectrum of Compound 2
S15: $^1$H-NMR (600 MHz, CDCl$_3$) Spectrum of Compound 2
S16: Expansion of the $^1$H-NMR Spectrum of Compound 2
S17: Expansion of the $^1$H-NMR Spectrum of Compound 2
S18: $^{13}$C-NMR and DEPT (600 MHz, CDCl$_3$) Spectrum of Compound 2
S19: Expansion of the $^{13}$C-NMR and DEPT Spectrum of Compound 2
S20: HSQC Spectrum (600MHz, CDCl$_3$) of Compound 2
S21: Expansion of the HSQC Spectrum of Compound 2
S22: HMBC Spectrum (600MHz, CDCl$_3$) of Compound 2
S23: Expansion of the HMBC Spectrum of Compound 2
S24: Expansion of the HMBC Spectrum of Compound 2
S25: $^1$H-$^1$H COSY Spectrum (600MHz, CDCl$_3$) of Compound 2
S26: Expansion of the $^1$H-$^1$H COSY Spectrum of Compound 2
S27: NOESY spectrum (600MHz, CDCl$_3$) of compound 2
S28: HRESI-MS Spectrum of Compound 3
S29: $^1$H-NMR (600 MHz, CDCl$_3$) Spectrum of Compound 3
S30: $^{13}$C-NMR and DEPT (600 MHz, CDCl$_3$) Spectrum of Compound 3
S31: HSQC Spectrum (600MHz, CDCl$_3$) of Compound 3
S32: Expansion of the HSQC Spectrum of Compound 3
S33: HMBC Spectrum (600MHz, CDCl$_3$) of Compound 3
S34: Expansion of the HMBC Spectrum of Compound 3
S35: Expansion of the HMBC Spectrum of Compound 3
S36: $^1$H-$^1$H COSY Spectrum (600MHz, CDCl$_3$) of Compound 3
S37: NOESY spectrum (600MHz, CDCl$_3$) of compound 3

S38: HRESI-MS Spectrum of Compound 4

S39: $^1$H-NMR (600 MHz, CDCl$_3$) Spectrum of Compound 4

S40: Expansion of the $^1$H-NMR Spectrum of Compound 4

S41: Expansion of the $^1$H-NMR Spectrum of Compound 4

S42: $^{13}$C-NMR and DEPT (600 MHz, CDCl$_3$) Spectrum of Compound 4

S43: Expansion of the $^{13}$C-NMR and DEPT Spectrum of Compound 4

S44: HSQC Spectrum (600MHz, CDCl$_3$) of Compound 4

S45: Expansion of the HSQC Spectrum of Compound 4

S46: HMBC Spectrum (600MHz, CDCl$_3$) of Compound 4

S47: Expansion of the HMBC Spectrum of Compound 4

S48: $^1$H-$^1$H COSY Spectrum (600MHz, CDCl$_3$) of Compound 4

S49: Expansion of the $^1$H-$^1$H COSY Spectrum of Compound 4

S50: NOESY spectrum (600MHz, CDCl$_3$) of compound 4
SI: HRESIMS Spectrum of Compound 1
**S2:** $^1$H-NMR Spectrum (600MHz, CDCl$_3$) of Compound 1

**Compound 1**: $^1$H-NMR (CDCl$_3$,600 MHz), δ: 1.20(3H, d, H-15), 1.77(3H, brs, H-14), 2.25(1H, dd, H-13β), 2.29(2H, m, H-6), 2.35(2H, m, H-2), 2.36(1H, m, H-3), 2.57(1H, br s, H-12), 2.73(2H, m, H-4), 2.77(1H, m, H-13α), 6.58(1H, t, H-7), 6.66(1H, br s, H-11). $^{13}$C-NMR (CDCl$_3$,600 MHz), δ: 16.4 (C-14), 20.9 (C-15), 30.3 (C-3), 30.8 (C-12), 32.5 (C-6), 33.9 (C-13), 37.3 (C-4), 37.4 (C-2),131.8 (C-7), 135.5 (C-10), 136.9 (C-8), 151.0 (C-11), 172.0 (C-1/5), 188.5 (C-9). EIMS: $m/z$ = 261[M]$^+$ for formula C$_{15}$H$_{19}$NO$_3$. 
S3: Expansion of the $^1$H-NMR Spectrum of Compound 1
S4: Expansion of the \(^1\)H-NMR Spectrum of Compound 1
S5: $^{13}$C-NMR and DEPT Spectrum (600MHz, CDCl$_3$) of Compound 1
S6: Expansion of the $^{13}$C-NMR and DEPT Spectrum of Compound 1
S7: HSQC Spectrum (600MHz, CDCl$_3$) of Compound 1
S8: Expansion of the COSY Spectrum of Compound 1
S10: Expansion of the HMBC Spectrum of Compound 1
S11: $^1$H-$^1$H COSY Spectrum (600MHz, CDCl$_3$) of Compound 1
S12: Expansion of the $^1$H-$^1$H COSY Spectrum of Compound 1
S13: NOESY spectrum (600MHz, CDCl$_3$) of compound 1
S14: HRESIMS Spectrum of Compound 2
**S15:** $^1$H-NMR Spectrum (600MHz, Acetone) of Compound 2

**Compound 2:** $^1$H-NMR (CDCl$_3$, 600 MHz), $\delta$: 1.14(3H, d, H-15), 1.78(3H, brs, H-14), 2.29(1H, dd, H-13$\beta$), 2.39(2H, m, H-6), 2.43(2H, m, H-4), 2.46(2H, m, H-2), 2.50(1H, m, H-3), 2.59(1H, br s, H-12), 2.90(1H, m, H-13$\alpha$), 6.61(1H, t, H-7), 6.73(1H, br s, H-11). $^{13}$C-NMR (CDCl$_3$, 600 MHz), $\delta$: 15.7 (C-14), 20.3 (C-15), 30.7 (C-12), 31.1 (C-6), 32.0 (C-3), 33.5 (C-13), 37.0 (C-4), 37.1 (C-2), 133.6 (C-7), 134.8 (C-10), 136.1 (C-8), 150.4 (C-11), 172.9 (C-1/5), 187.4 (C-9). EIMS: $m/z$ = 280[M]$^+$ for formula C$_{15}$H$_{20}$O$_5$. 

18
S16: Expansion of the $^1$H-NMR Spectrum of Compound 2
S17: Expansion of the $^1$H-NMR Spectrum of Compound 2
S18: $^{13}$C-NMR and DEPT Spectrum (600MHz, Acetone) of Compound 2
S19: Expansion of the $^{13}$C-NMR and DEPT Spectrum of Compound 2
S20: HSQC Spectrum (600MHz, CDCl$_3$) of Compound 2
S21: Expansion of the HSQC Spectrum of Compound 2
S22: HMBC Spectrum (600MHz, Acetone) of Compound 2
S23: Expansion of the HMBC Spectrum of Compound 2
S24: Expansion of the HMBC Spectrum of Compound 2
S25: $^1$H-$^1$H COSY Spectrum (600MHz, Acetone) of Compound 2
S26: Expansion of the $^1$H-$^1$H COSY Spectrum of Compound 2
S27: NOESY Spectrum (600MHz, Acetone) of Compound 2
### HRESIMS Spectrum of Compound 3

<table>
<thead>
<tr>
<th>Sum Formula</th>
<th>Sigma</th>
<th>m/z</th>
<th>Err (ppm)</th>
<th>Mean Err (ppm)</th>
<th>Err [mDa]</th>
<th>db</th>
<th>N Rule</th>
<th>e⁻</th>
</tr>
</thead>
<tbody>
<tr>
<td>C₁₂ H₂₀ N₂ O₆</td>
<td>0.021</td>
<td>302.1347</td>
<td>-2.37</td>
<td>-3.67</td>
<td>-0.72</td>
<td>4.50</td>
<td>ok</td>
<td>even</td>
</tr>
<tr>
<td>C₁₄ H₂₂ O₇</td>
<td>0.016</td>
<td>302.1393</td>
<td>2.95</td>
<td>0.86</td>
<td>0.63</td>
<td>6.00</td>
<td>ok</td>
<td>odd</td>
</tr>
<tr>
<td>C₁₅ H₂₁ N₁ Na₁ O₄</td>
<td>0.010</td>
<td>302.1363</td>
<td>2.90</td>
<td>1.61</td>
<td>0.90</td>
<td>6.50</td>
<td>ok</td>
<td>even</td>
</tr>
</tbody>
</table>

S28: HRESIMS Spectrum of Compound 3
S29: $^1$H-NMR Spectrum (600MHz, CDCl$_3$) of Compound 3

Compound 3: $^1$H-NMR (CDCl$_3$,600 MHz), δ: 1.15(3H, d, H-15), 1.83(3H, brs, H-14), 2.25(1H, dd, H-13β), 2.33(2H, m, H-6), 2.35(2H, m, H-4), 2.43(2H, m, H-2), 2.54(1H, m, H-3), 2.57(1H, m, H-12), 2.83(1H, dd, H-13α), 6.64(1H, br s, H-7), 6.67(1H, br s, H-11). $^{13}$C-NMR (CDCl$_3$,600 MHz), δ: 16.4 (C-14), 20.9 (C-15), 30.8 (C-12), 33.3 (C-6), 32.8 (C-3), 33.8 (C-13), 38.4 (C-2), 39.7 (C-4), 134.3 (C-7), 135.2 (C-10), 136.1 (C-8), 151.6 (C-11), 176.1 (C-1/5), 189.3(C-9). EIMS: $m/z = 279[M]^+$ for formula C$_{15}$H$_{21}$NO$_4$. 
S30: $^{13}$C-NMR and DEPT Spectrum (600MHz, CDCl$_3$) of Compound 3
S31: HSQC Spectrum (600MHz, CDCl$_3$) of Compound 3
S32: Expansion of the HSQC Spectrum of Compound 3
S33: HMBC Spectrum (600MHz, CDCl$_3$) of Compound 3
S34: Expansion of the HMBC Spectrum of Compound 3
S35: Expansion of the HMBC Spectrum of Compound 3
S36: $^1$H-$^1$H COSY Spectrum (600MHz, CDCl$_3$) of Compound 3
S37: NOESY Spectrum (600MHz, CDCl₃) of Compound 3
S38: HRESIMS Spectrum of Compound 4
Compound 4: $^1$H-NMR (CDCl$_3$, 600 MHz), δ: 0.98 (3H, d, H-13), 1.24 (3H, d, H-12), 1.32 (1H, dd, H-4β), 1.63 (1H, td, H-9β), 1.78 (1H, td, H-7β), 1.89 (1H, m, H-9α), 2.19 (1H, m, H-7α), 2.19 (1H, m, H-8), 2.22 (1H, m, H-2β), 2.22 (1H, m, H-4α), 2.34 (2H, t, H-14), 2.49 (1H, m, H-3), 2.60 (1H, m, H-10), 2.73 (1H, m, H-6), 2.78 (1H, m, H-2α), 3.68 (3H, d, O-Me), 4.58 (1H, ddd, H-5). $^{13}$C-NMR (CDCl$_3$, 600 MHz), δ: 16.4 (C-14), 20.9 (C-15), 30.8 (C-12), 33.3 (C-6), 32.8 (C-3), 33.8 (C-13), 38.4 (C-2), 39.7 (C-4), 134.3 (C-7), 135.2 (C-10), 136.1 (C-8), 151.6 (C-11), 176.1 (C-1/5), 189.3 (C-9). EIMS: m/z = 296[M]$^+$ for formula C$_{16}$H$_{24}$O$_5$. 

S39: $^1$H-NMR Spectrum (600MHz, CDCl$_3$) of Compound 4
S40: Expansion of the $^1$H-NMR Spectrum of Compound 4
S41: Expansion of the $^1$H-NMR Spectrum of Compound 4
S42: $^{13}$C-NMR Spectrum (600MHz, CDCl$_3$) of Compound 4
S43: Expansion of the $^{13}$C-NMR Spectrum of Compound 4
S44: HSQC Spectrum (600MHz, CDCl$_3$) of Compound 4
S45: Expansion of the HSQC Spectrum of Compound 4
S46: HMBC Spectrum (600MHz, CDCl$_3$) of Compound 4
S47: Expansion of the HMBC Spectrum of Compound 4
S48: $^1$H-$^1$H COSY Spectrum (600MHz, CDCl$_3$) of Compound 4
S49: Expansion of the $^1$H-$^1$H COSY Spectrum of Compound 4
S50: NOESY Spectrum (600MHz, CDCl₃) of Compound 4