SUPPLEMENTARY MATERIAL

A new thiodiketopiperzaine from the marine sponge *Tedania* sp.

Hua Zhang, Wei Lai, Zhuo-Bin Guan, Xiao-Jian Liao, Bing-Xin Zhao* and Shi-Hai Xu*

*Department of Chemistry, College of Chemistry and Materials Science, Jinan University, Guangzhou, 510632, P. R. China

*Corresponding authors
E-mail addresses: zbx840622@163.com; txush@jnu.edu.cn.

**Abstract:** A new thiodiketopiperzaine, tedanizaine A (1), together with six known ones, were isolated from the marine sponge *Tedania* sp.. Their structures were determined by spectroscopic analyses. The absolute configuration of 1 was established by ECD calculation. Compound 1 was the second example of thiodiketopiperazine bearing a thiazolidine unit. Cytotoxic activities of 1 were also evaluated.

**Keywords:** sponge; *Tedania* sp.; thiodiketopiperzaine
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Quantum chemical ECD calculations of 1

The molecules of (2S, 5S, 11R)-1 and (2R, 5R, 11S)-1 were converted into SMILES codes before their initial 3D structures were generated with CORINA version 3.4. Conformer databases were generated in CONFLEX version 7.0 using the MMFF94s force-field, with an energy window for acceptable conformers (ewindow) of 10 kcal mol\(^{-1}\) above the ground state, a maximum number of conformations per molecule (maxconfs) of 100, and an RMSD cutoff (rmsd) of 0.5 Å. Then each conformer of the acceptable conformers was optimized with HF/6-31G(d) method in Gaussian09. Further optimization at the APFD/6-31G(d) level led the dihedral angles to be got. After that, four stable conformers were obtained. The optimized conformers were taken for the ECD calculations, which were performed with Gaussian09 (APFD/6-311++G(2d,p)). The solvent effect was taken into account by the polarizable-conductor calculation model (IEFPCM, methanol as the solvent). Comparisons of the experimental and calculated spectra were done with the software SpecDis. It was also used to apply a UV shift to the ECD spectra, Gaussian broadening of the excitations, and Boltzmann weighting of the spectra.

Table S1. Conformers distribution of (2S, 5S, 11R)-1 at the APFD/6-31G(d) level with solvated model

| Conformers | Population % | Conformers | Population % |
|------------|--------------|------------|--------------|
| 1          | 52.82        | 3          | 11.95        |
| 2          | 33.40        | 4          | 1.83         |

Figure S1. Experimental ECD spectrum of 1 and calculated ECD spectra of (2S, 5S, 11R)-1 and (2R, 5R, 11S)-1 (UV correction = 0 nm, band width $\sigma = 0.3$ eV)
Table S2. $^1$H and $^{13}$C NMR spectral data of 1 (in CDCl$_3$, $\delta$, $J$ in Hz)$^a$

| No. | $\delta$$_H$       | $\delta$$_C$  |
|-----|-------------------|--------------|
| 2   | 5.47 q (6.3)      | 59.2         |
| 4   | -                 | 164.7        |
| 5   | 4.19 t (8.1)      | 60.4         |
| 6   | a 2.31-2.42       | 28.0         |
|     | b 1.97-2.21       |              |
| 7   | 1.87-2.20, 2H     | 23.0         |
| 8   | 3.55-3.67, 2H     | 45.4         |
| 10  | -                 | 164.1        |
| 11  | 4.51 t (6.6)      | 62.0         |
| 12  | a 3.49            | 31.9         |
|     | b 3.45 dd (19.2, 7.2) |          |
| 13  | 1.57 d (6.3)      | 22.4         |

$^a$ Overlapped signals are reported without designating multiplicity.

Figure S2. Key $^1$H-$^1$H COSY and HMBC correlations of 1.

Figure S3. Key NOE correlations of 1.
Figure S4. UV spectrum of 1

Figure S5. IR spectrum of 1
**Summary**

| Compound Name (Library #) | Formula | Intensity | Threshold | Expected p.p.m. | Found at p.p.m. | Error (p.p.m.) | Expected RT (min) | Found RT (min) | RT Delta (min) | Isotope (wt%) | Purity (%) |
|---------------------------|---------|-----------|-----------|----------------|----------------|---------------|------------------|----------------|----------------|--------------|------------|
|                           |         |           |           |                |                |               |                  |                |                |              |            |

- Spectrum from sample with (sample 1) - Sampled: 01, Experiment 1, +TOF MS (100–1000) from 0.167 to 0.200 min
- C10H14NO2S + H

**Figure S6.** HR-ESI-MS spectrum of 1

**Figure S7.** $^1$H NMR spectrum of 1 (300 MHz in CDCl$_3$)
Figure S8. $^{13}$C NMR spectrum of 1 (75 MHz in CDCl$_3$)

Figure S9. $^1$H-$^1$H COSY spectrum of 1
Figure S10. HSQC spectrum of 1

Figure S11. HMBC spectrum of 1
Figure S12. NOESY spectrum of 1