

# **Supporting Information**

## **Lignans and Neolignans with Antioxidant and Human Cancer Cell Proliferation Inhibitory Activities from *Cinnamomum bejolghota* Confirm its Functional Food Property**

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## S1. ECD Calculations.

**Figure S1.**  $^1\text{H}$ - $^1\text{H}$  COSY (—), Selected HMBC ( $\text{H} \rightarrow \text{C}$ ) and key ROESY ( $\text{H} \leftrightarrow \text{H}$ ) correlations of **2**

**Figure S2.**  $^1\text{H}$ - $^1\text{H}$  COSY (—), Selected HMBC ( $\text{H} \rightarrow \text{C}$ ) and key ROESY ( $\text{H} \leftrightarrow \text{H}$ ) correlations of **3**

**Figure S3.**  $^1\text{H}$ - $^1\text{H}$  COSY (—), Selected HMBC ( $\text{H} \rightarrow \text{C}$ ) and key ROESY ( $\text{H} \leftrightarrow \text{H}$ ) correlations of **4**

**Figure S4.**  $^1\text{H}$ - $^1\text{H}$  COSY (—), Selected HMBC ( $\text{H} \rightarrow \text{C}$ ) and key ROESY ( $\text{H} \leftrightarrow \text{H}$ ) correlations of **10**

### For bejolghotin A (**1**)

**Figure S5.**  $^1\text{H}$  NMR spectrum (600 MHz) of bejolghotin A (**1**) in  $\text{CDCl}_3$

**Figure S6.**  $^{13}\text{C}$  NMR spectrum (150 MHz) of bejolghotin A (**1**) in  $\text{CDCl}_3$

**Figure S7.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum (600 MHz) of bejolghotin A (**1**) in  $\text{CDCl}_3$

**Figure S8.** HSQC spectrum (600 MHz) of bejolghotin A (**1**) in  $\text{CDCl}_3$

**Figure S9.** HMBC spectrum (600 MHz) of bejolghotin A (**1**) in  $\text{CDCl}_3$

**Figure S10.** ROESY spectrum (600 MHz) of bejolghotin A (**1**) in  $\text{CDCl}_3$

**Figure S11.** HRESIMS spectrum of bejolghotin A (**1**)

**Figure S12.** UV spectrum of bejolghotin A (**1**)

**Figure S13.** IR spectrum (KBr disc) of bejolghotin A (**1**)

### For bejolghotin B (**2**)

**Figure S14.**  $^1\text{H}$  NMR spectrum (600 MHz) of bejolghotin B (**2**) in  $\text{CDCl}_3$

**Figure S15.**  $^{13}\text{C}$  NMR spectrum (150 MHz) of bejolghotin B (**2**) in  $\text{CDCl}_3$

**Figure S16.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum (600 MHz) of bejolghotin B (**2**) in  $\text{CDCl}_3$

**Figure S17.** HSQC spectrum (600 MHz) of bejolghotin B (**2**) in  $\text{CDCl}_3$

**Figure S18.** HMBC spectrum (600 MHz) of bejolghotin B (**2**) in  $\text{CDCl}_3$

**Figure S19.** ROESY spectrum (600 MHz) of bejolghotin B (**2**) in  $\text{CDCl}_3$

**Figure S20.** HRESIMS spectrum of bejolghotin B (**2**)

**Figure S21.** UV spectrum of bejolghotin B (**2**)

**Figure S22.** IR spectrum (KBr disc) of bejolghotin B (**2**)

### For bejolghotin C (**3**)

**Figure S23.**  $^1\text{H}$  NMR spectrum (600 MHz) of bejolghotin C (**3**) in  $\text{CDCl}_3$

**Figure S24.**  $^{13}\text{C}$  NMR spectrum (150 MHz) of bejolghotin C (**3**) in  $\text{CDCl}_3$

**Figure S25.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum (600 MHz) of bejolghotin C (**3**) in  $\text{CDCl}_3$

**Figure S26.** HSQC spectrum (600 MHz) of bejolghotin C (**3**) in  $\text{CDCl}_3$

**Figure S27.** HMBC spectrum (600 MHz) of bejolghotin C (**3**) in  $\text{CDCl}_3$

**Figure S28.** ROESY spectrum (600 MHz) of bejolghotin C (**3**) in  $\text{CDCl}_3$

**Figure S29.** HRESIMS spectrum of bejolghotin C (**3**)

**Figure S30.** UV spectrum of bejolghotin C (**3**)

**Figure S31.** IR spectrum (KBr disc) of bejolghotin C (**3**)

#### For bejolghotin D (**4**)

**Figure S32.**  $^1\text{H}$  NMR spectrum (600 MHz) of bejolghotin D (**4**) in  $\text{CDCl}_3$

**Figure S33.**  $^{13}\text{C}$  NMR spectrum (150 MHz) of bejolghotin D (**4**) in  $\text{CDCl}_3$

**Figure S34.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum (600 MHz) of bejolghotin D (**4**) in  $\text{CDCl}_3$

**Figure S35.** HSQC spectrum (600 MHz) of bejolghotin D (**4**) in  $\text{CDCl}_3$

**Figure S36.** HMBC spectrum (600 MHz) of bejolghotin D (**4**) in  $\text{CDCl}_3$

**Figure S37.** ROESY spectrum (600 MHz) of bejolghotin D (**4**) in  $\text{CDCl}_3$

**Figure S38.** HRESIMS spectrum of bejolghotin D (**4**)

**Figure S39.** UV spectrum of bejolghotin D (**4**)

**Figure S40.** IR spectrum (KBr disc) of bejolghotin D (**4**)

#### For bejolghotin E (**9**)

**Figure S41.**  $^1\text{H}$  NMR spectrum (600 MHz) of bejolghotin E (**9**) in  $\text{CDCl}_3$

**Figure S42.**  $^{13}\text{C}$  NMR spectrum (150 MHz) of bejolghotin E (**9**) in  $\text{CDCl}_3$

**Figure S43.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum (600 MHz) of bejolghotin E (**9**) in  $\text{CDCl}_3$

**Figure S44.** HSQC spectrum (600 MHz) of bejolghotin E (**9**) in  $\text{CDCl}_3$

**Figure S45.** HMBC spectrum (600 MHz) of bejolghotin E (**9**) in  $\text{CDCl}_3$

**Figure S46.** ROESY spectrum (600 MHz) of bejolghotin E (**9**) in  $\text{CDCl}_3$

**Figure S47.** HRESIMS spectrum of bejolghotin E (**9**)

**Figure S48.** UV spectrum of bejolghotin E (**9**)

**Figure S49.** IR spectrum (KBr disc) of bejolghotin E (**9**)

#### For bejolghotin F (**10**)

**Figure S50.**  $^1\text{H}$  NMR spectrum (600 MHz) of bejolghotin F (**10**) in  $\text{CDCl}_3$

**Figure S51.**  $^{13}\text{C}$  NMR spectrum (150 MHz) of bejolghotin F (**10**) in  $\text{CDCl}_3$

**Figure S52.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum (600 MHz) of bejolghotin F (**10**) in  $\text{CDCl}_3$

**Figure S53.** HSQC spectrum (600 MHz) of bejolghotin F (**10**) in  $\text{CDCl}_3$

**Figure S54.** HMBC spectrum (600 MHz) of bejolghotin F (**10**) in  $\text{CDCl}_3$

**Figure S55.** ROESY spectrum (600 MHz) of bejolghotin F (**10**) in  $\text{CDCl}_3$

**Figure S56.** HRESIMS spectrum of bejolghotin F (**10**)

**Figure S57.** UV spectrum of bejolghotin F (**10**)

**Figure S58.** IR spectrum (KBr disc) of bejolghotin F (**10**)

#### For bejolghotin G (**11**)

**Figure S59.**  $^1\text{H}$  NMR spectrum (600 MHz) of bejolghotin G (**11**) in  $\text{CDCl}_3$

**Figure S60.**  $^{13}\text{C}$  NMR spectrum (150 MHz) of bejolghotin G (**11**) in  $\text{CDCl}_3$

**Figure S61.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum (600 MHz) of bejolghotin G (**11**) in  $\text{CDCl}_3$

**Figure S62.** HSQC spectrum (600 MHz) of bejolghotin G (**11**) in  $\text{CDCl}_3$

**Figure S63.** HMBC spectrum (600 MHz) of bejolghotin G (**11**) in  $\text{CDCl}_3$

**Figure S64.** ROESY spectrum (600 MHz) of bejolghotin G (**11**) in  $\text{CDCl}_3$

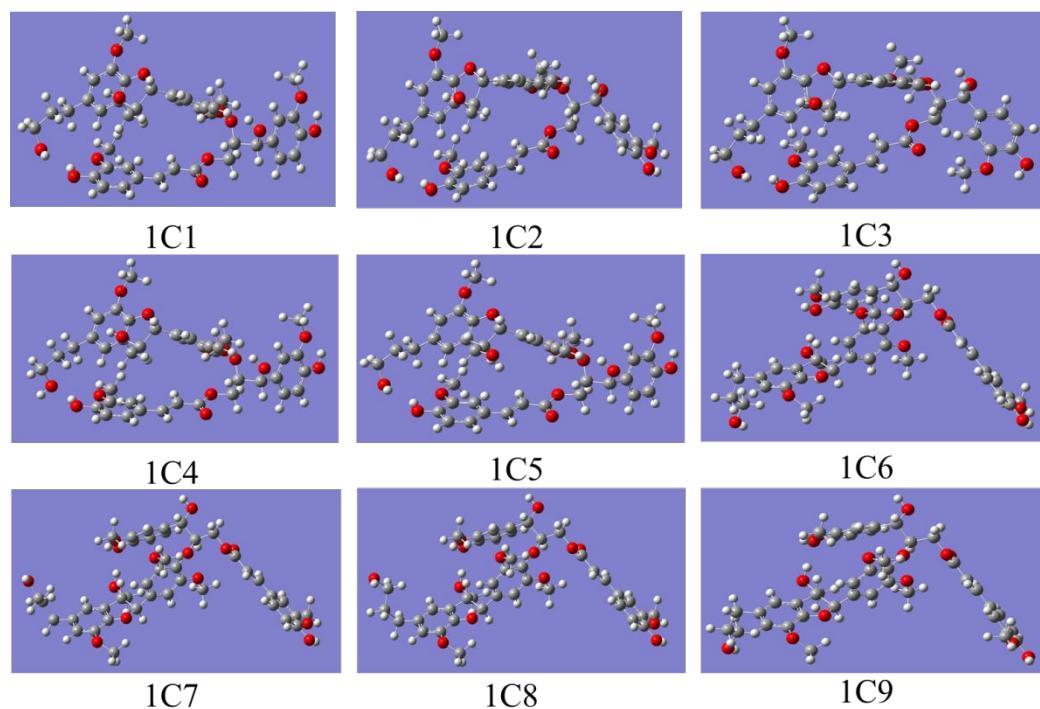
**Figure S65.** HRESIMS spectrum of bejolghotin G (**11**)

**Figure S66.** UV spectrum of bejolghotin G (**11**)

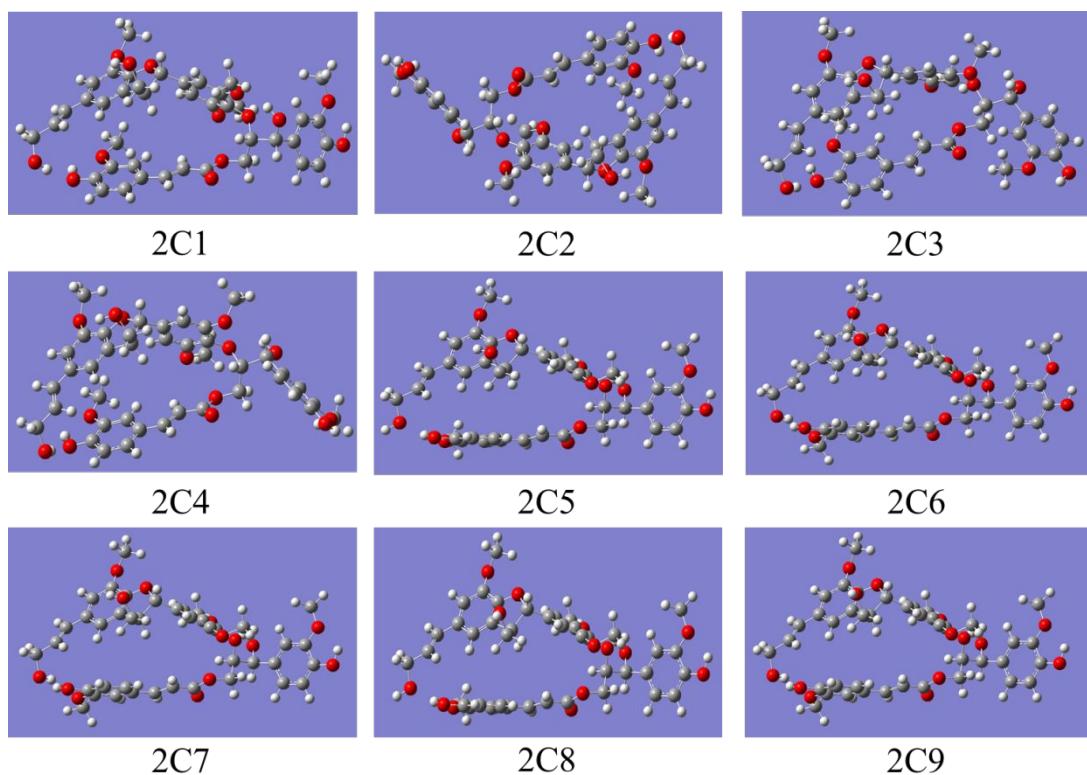
**Figure S67.** IR spectrum (KBr disc) of bejolghotin G (**11**)

## S1. ECD Calculations.

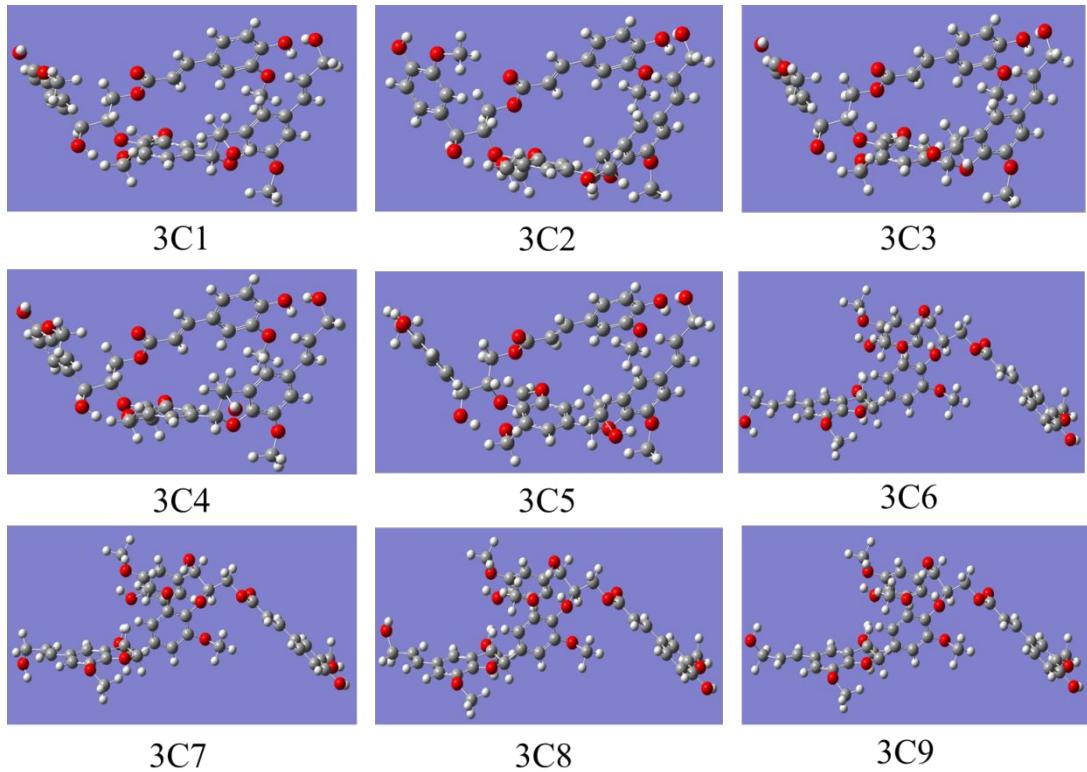
Conformational search was carried out by CONFLEX using the Merck molecular force field (MMFF) with standard parameters.<sup>1</sup> Next, they were subjected to geometry optimization at the B3LYP/6-31G(d) level of DFT calculations. Based on the DFT energies, conformers with a Boltzmann distribution  $\geq 1\%$  were chosen for ECD calculations. The conformers were imported into Gaussian 09 package.<sup>2</sup> The ECD curves of the conformers were calculated by the TDDFT method at the B3LYP/6-311++G (2d, p) level with the CPCM model in a methanol solution.



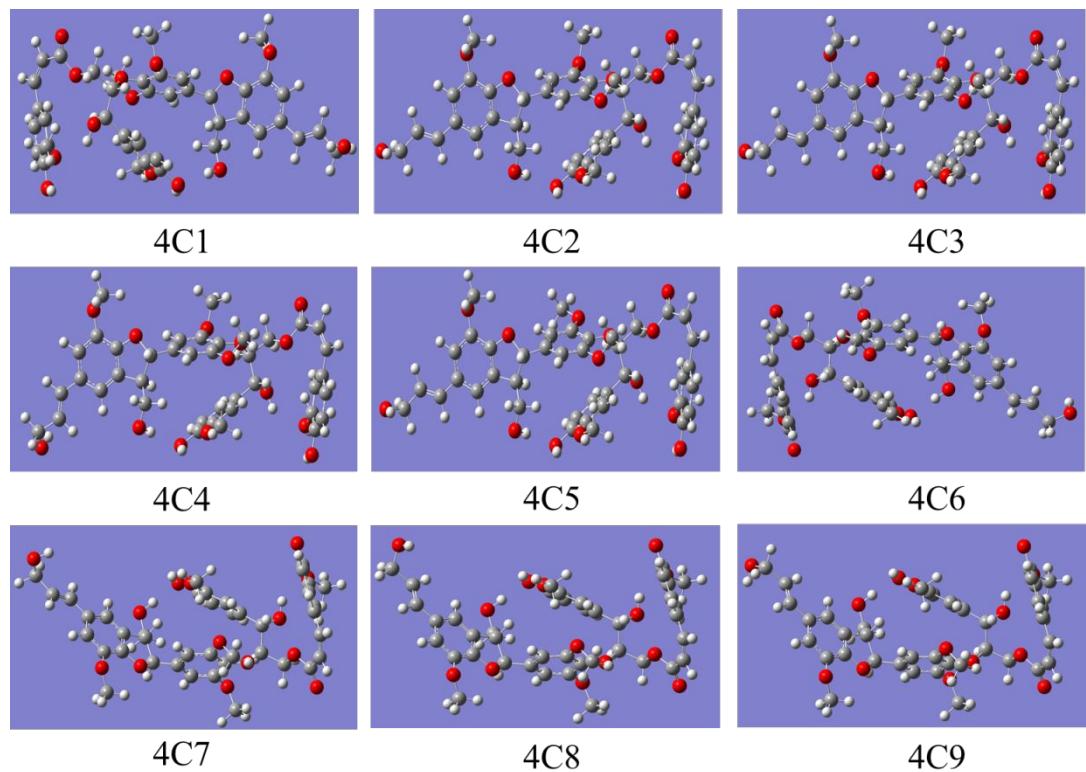
**Fig. 1.** B3LYP/6-311+G(d,p) optimized lowest energy conformers for compound **1**.



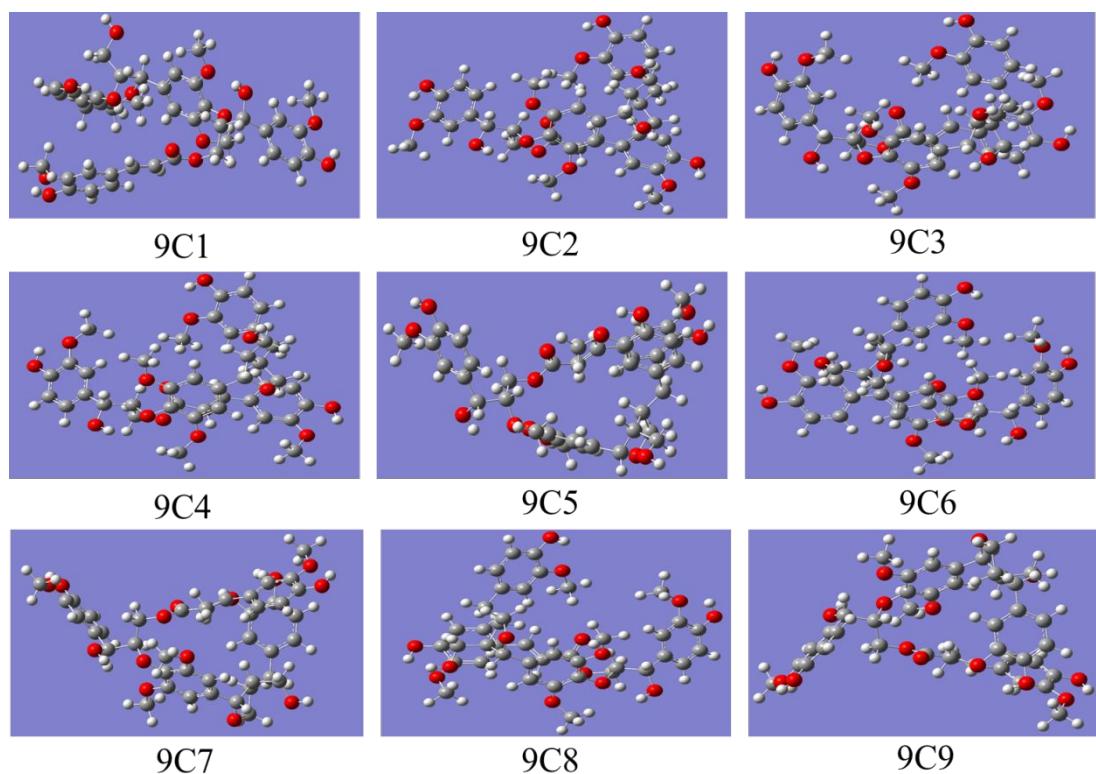
**Fig. 2.** B3LYP/6-311+G(d,p) optimized lowest energy conformers for compound 2.



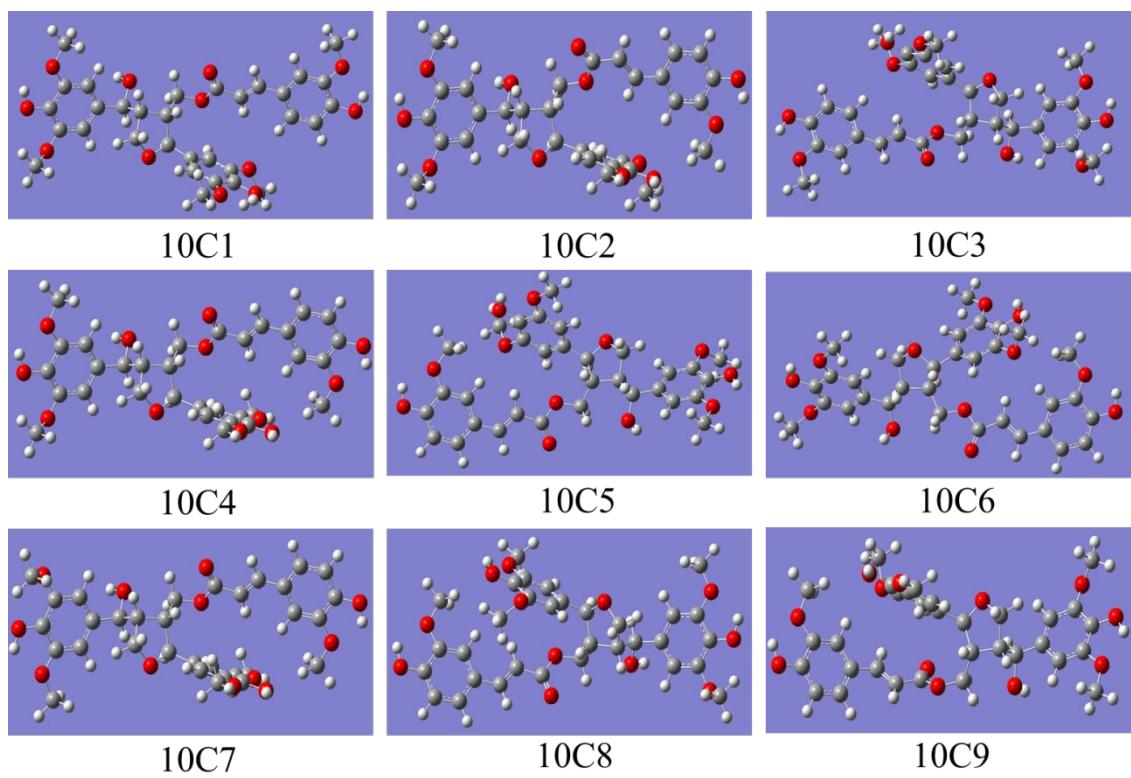
**Fig. 3.** B3LYP/6-311+G(d,p) optimized lowest energy conformers for compound 3.



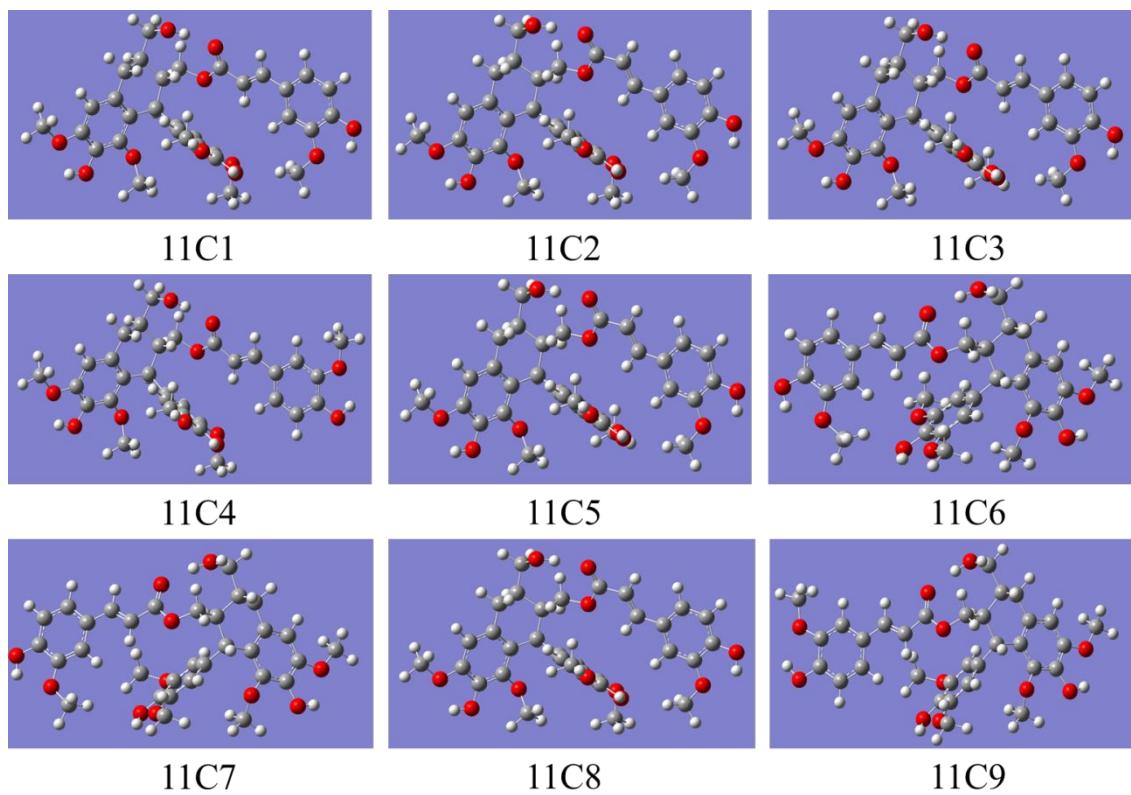
**Fig. 4.** B3LYP/6-311+G(d,p) optimized lowest energy conformers for compound **4**.



**Fig. 5.** B3LYP/6-311+G(d,p) optimized lowest energy conformers for compound **9**.



**Fig. 6.** B3LYP/6-311+G(d,p) optimized lowest energy conformers for compound **10**.

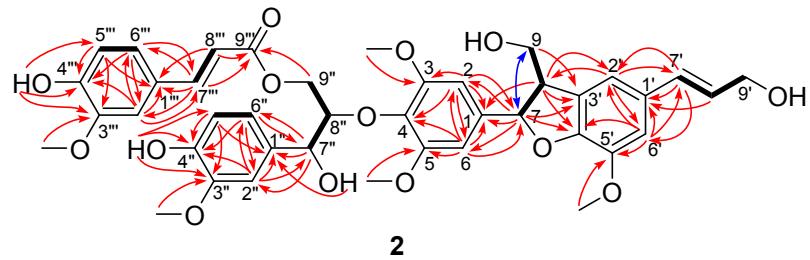


**Fig. 7.** B3LYP/6-311+G(d,p) optimized lowest energy conformers for compound **11**.

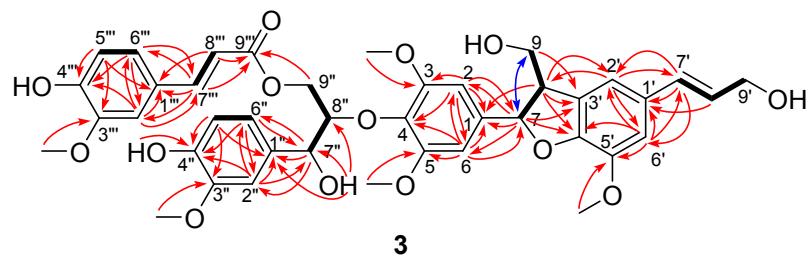
## **Reference:**

- (1) Jagannadh, B.; Reddy, S. S.; Thangavelu, R. P. Conformational preferences of 1,4,7-trithiacyclononane: a molecular mechanics and density functional theory study. *J. Mol. Model.* **2004**, *10*, 55–59.
- (2) Frisch, M. J.; Trucks, G. W.; Schlegel, H. B.; Scuseria, G. E.; Robb, M. A.; Cheeseman, J. R.; Scalmani, G.; Barone, V.; Petersson, G. A.; Nakatsuji, H.; Li, X.; Caricato, M.; Marenich, A.; Bloino, J.; Janesko, B. G.; Gomperts, R.; Mennucci, B.; Hratchian, H. P.; Ortiz, J. V.; Izmaylov, A. F.; Sonnenberg, J. L.; Williams-Young, D.; Ding, F.; Lipparini, F.; Egidi, F.; Goings, J.; Peng, B.; Petrone, A.; Henderson, T.; Ranasinghe, D.; Zakrzewski, V. G.; Gao, J.; Rega, N.; Zheng, G.; Liang, W.; Hada, M.; Ehara, M.; Toyota, K.; Fukuda, R.; Hasegawa, J.; Ishida, M.; Nakajima, T.; Honda, Y.; Kitao, O.; Nakai, H.; Vreven, T.; Throssell, K.; Montgomery, Jr., J. A.; Peralta, J. E.; Ogliaro, F.; Bearpark, M.; Heyd, J. J.; Brothers, E.; Kudin, K. N.; Staroverov, V. N.; Keith, T.; Kobayashi, R.; Normand, J.; Raghavachari, K.; Rendell, A.; Burant, J. C.; Iyengar, S. S.; Tomasi, J.; Cossi, M.; Millam, J. M.; Klene, M.; Adamo, C.; Cammi, R.; Ochterski, J. W.; Martin, R. L.; Morokuma, K.; Farkas, O.; Foresman, J. B.; Fox, D. J. Gaussian, Inc.: Wallingford CT, 2016.

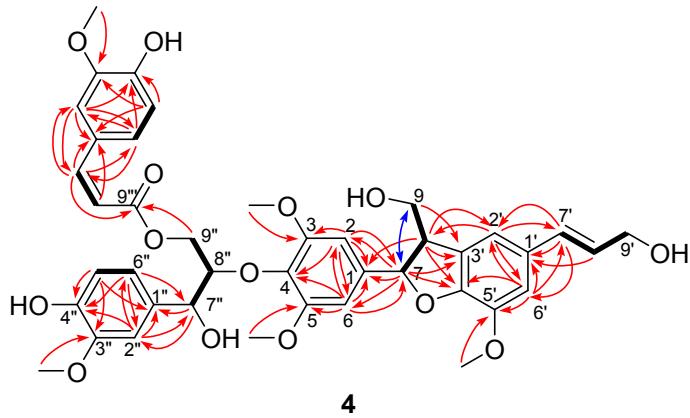
**Figure S1.**  $^1\text{H}$ - $^1\text{H}$  COSY (—), Selected HMBC ( $\text{H} \rightarrow \text{C}$ ) and key ROESY ( $\text{H} \leftrightarrow \text{H}$ ) correlations of **2**



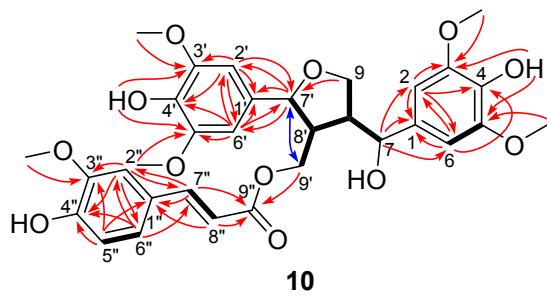
**Figure S2.**  $^1\text{H}$ - $^1\text{H}$  COSY (—), Selected HMBC ( $\text{H} \rightarrow \text{C}$ ) and key ROESY ( $\text{H} \leftrightarrow \text{H}$ ) correlations of **3**



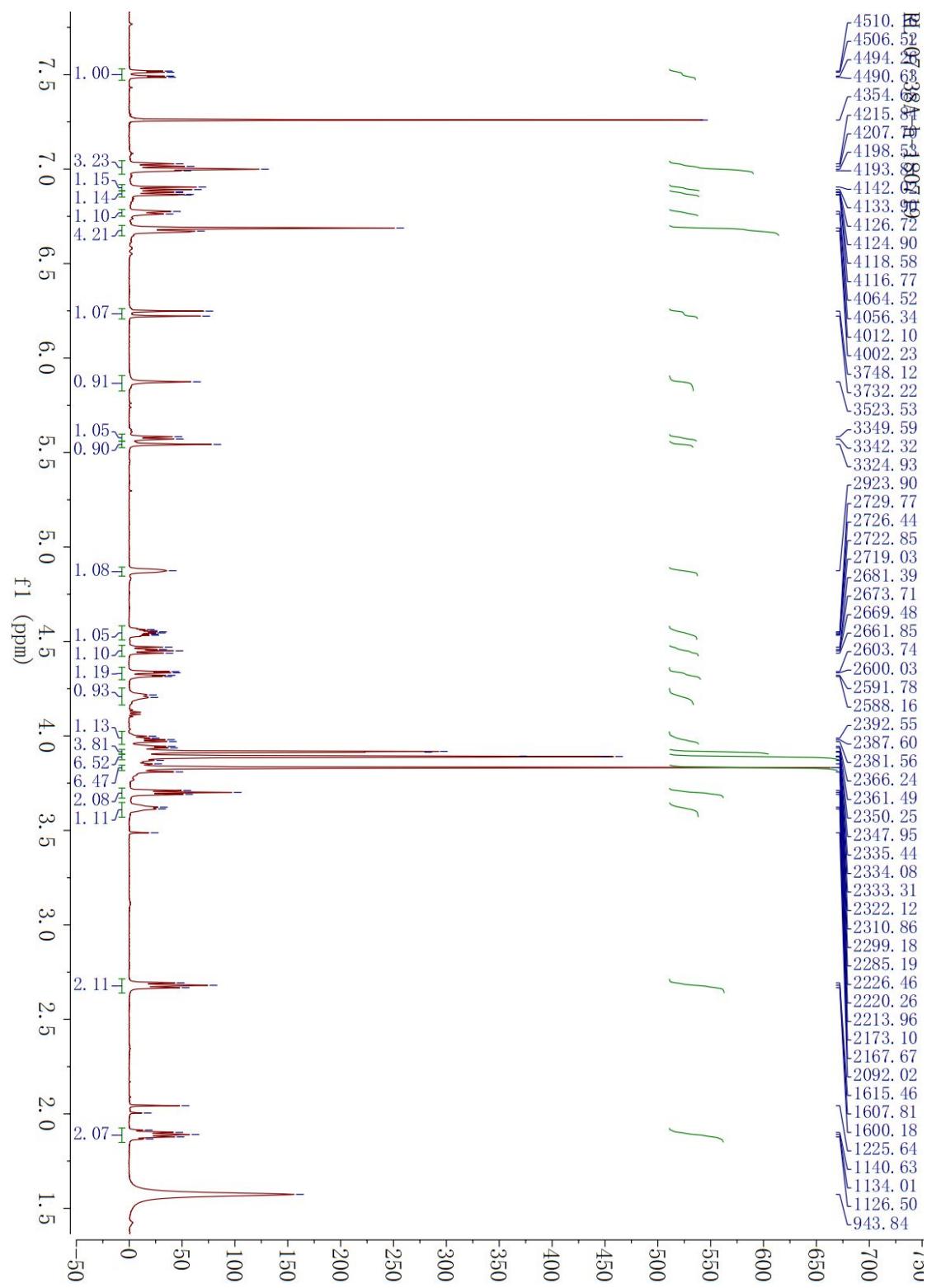
**Figure S3.**  $^1\text{H}$ - $^1\text{H}$  COSY (—), Selected HMBC ( $\text{H} \rightarrow \text{C}$ ) and key ROESY ( $\text{H} \leftrightarrow \text{H}$ ) correlations of **4**



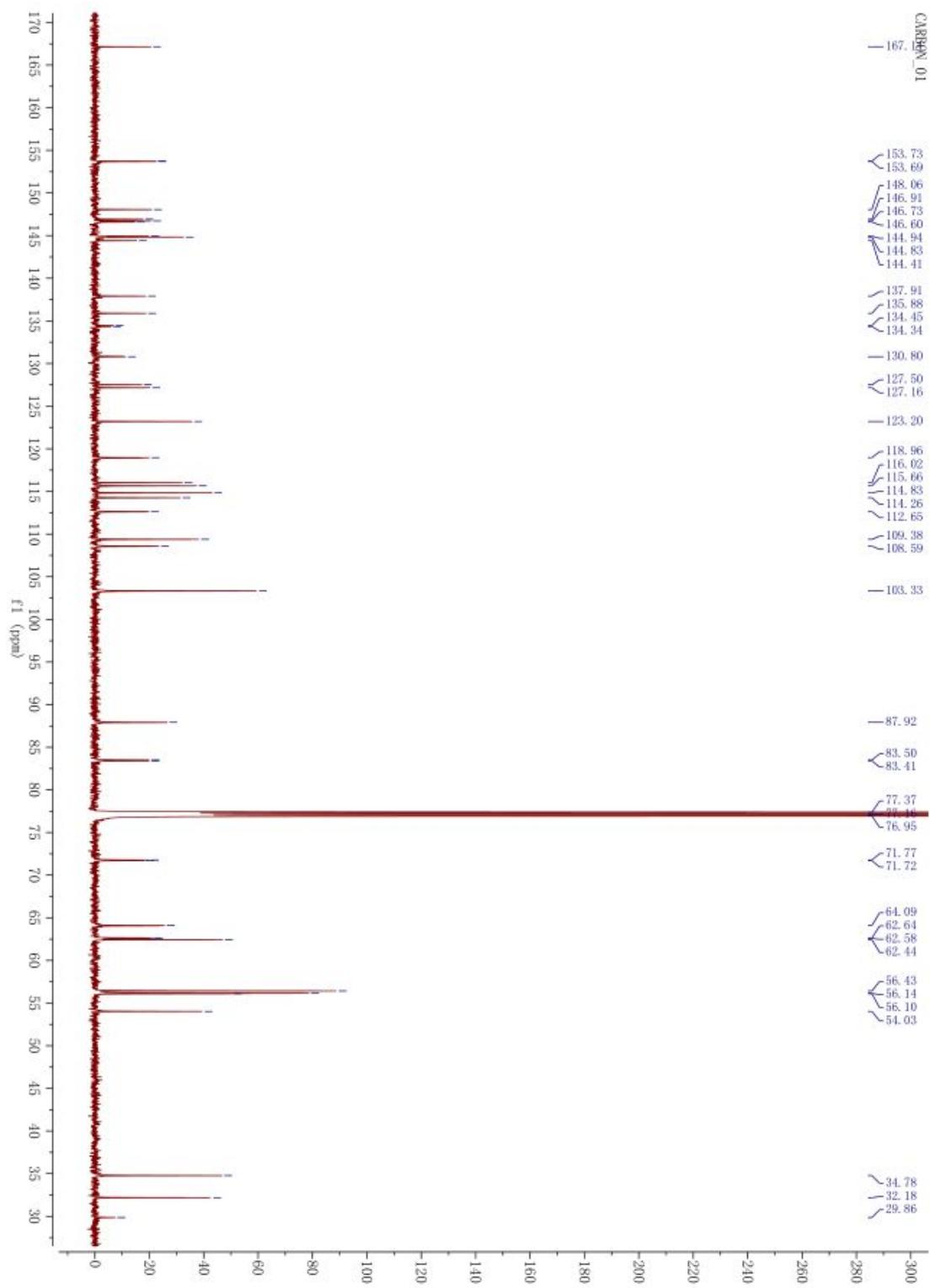
**Figure S4.**  $^1\text{H}$ - $^1\text{H}$  COSY (—), Selected HMBC ( $\text{H} \rightarrow \text{C}$ ) and key ROESY ( $\text{H} \leftrightarrow \text{H}$ ) correlations of **10**



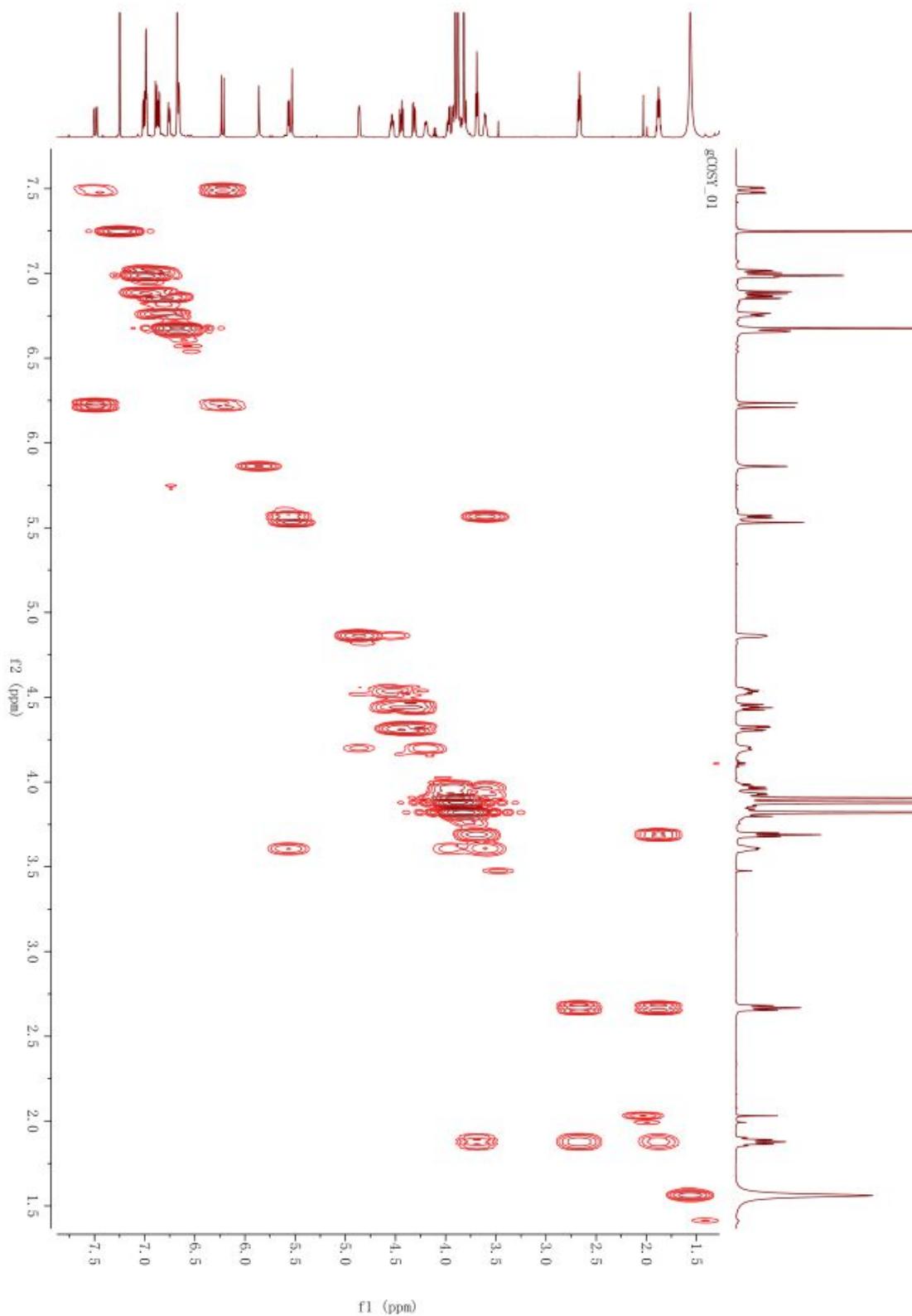
**Figure S5.**  $^1\text{H}$  NMR spectrum (600 MHz) of bejolghotin A (**1**) in  $\text{CDCl}_3$



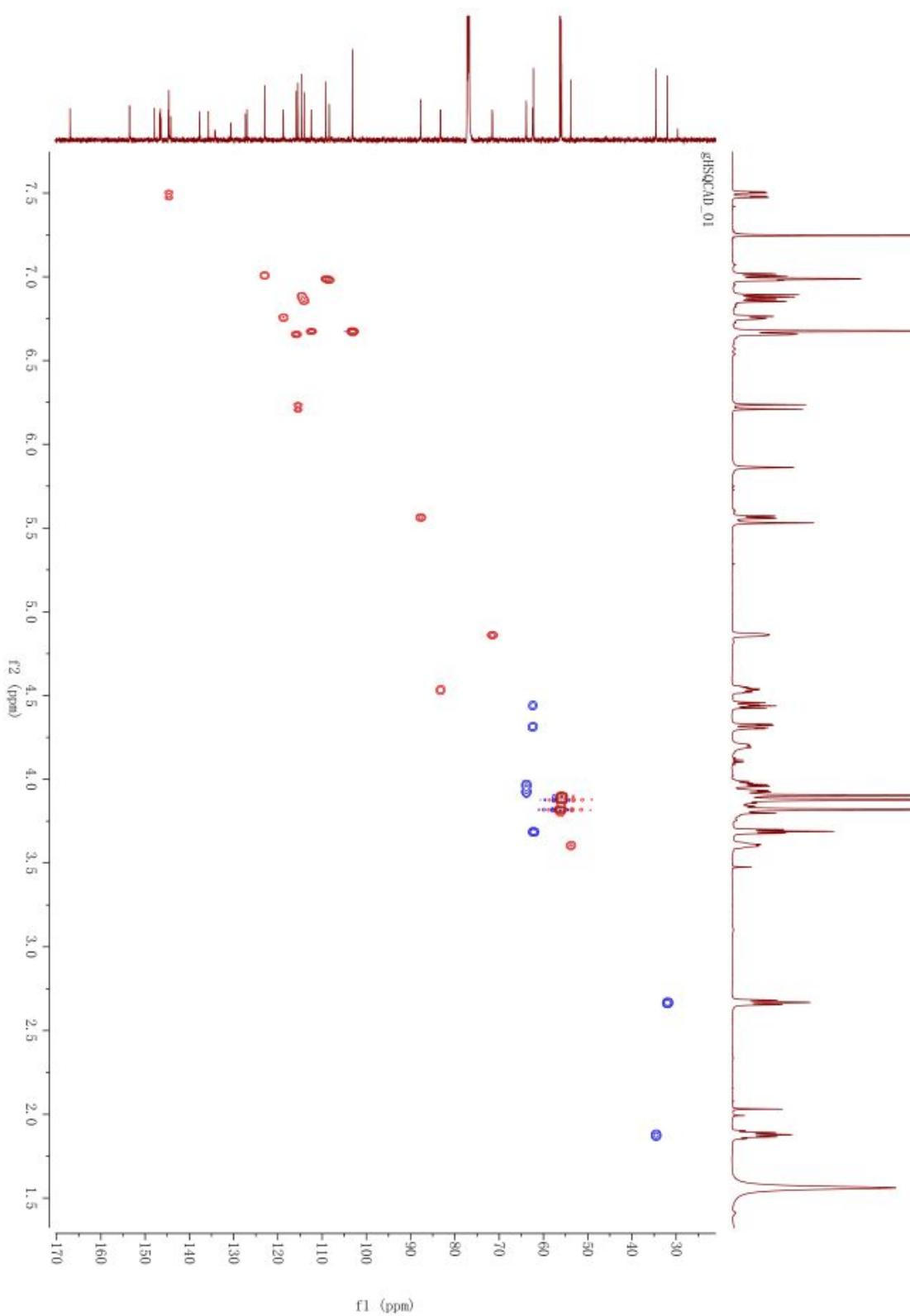
**Figure S6.**  $^{13}\text{C}$  NMR spectrum (150 MHz) of bejolghotin A (**1**) in  $\text{CDCl}_3$



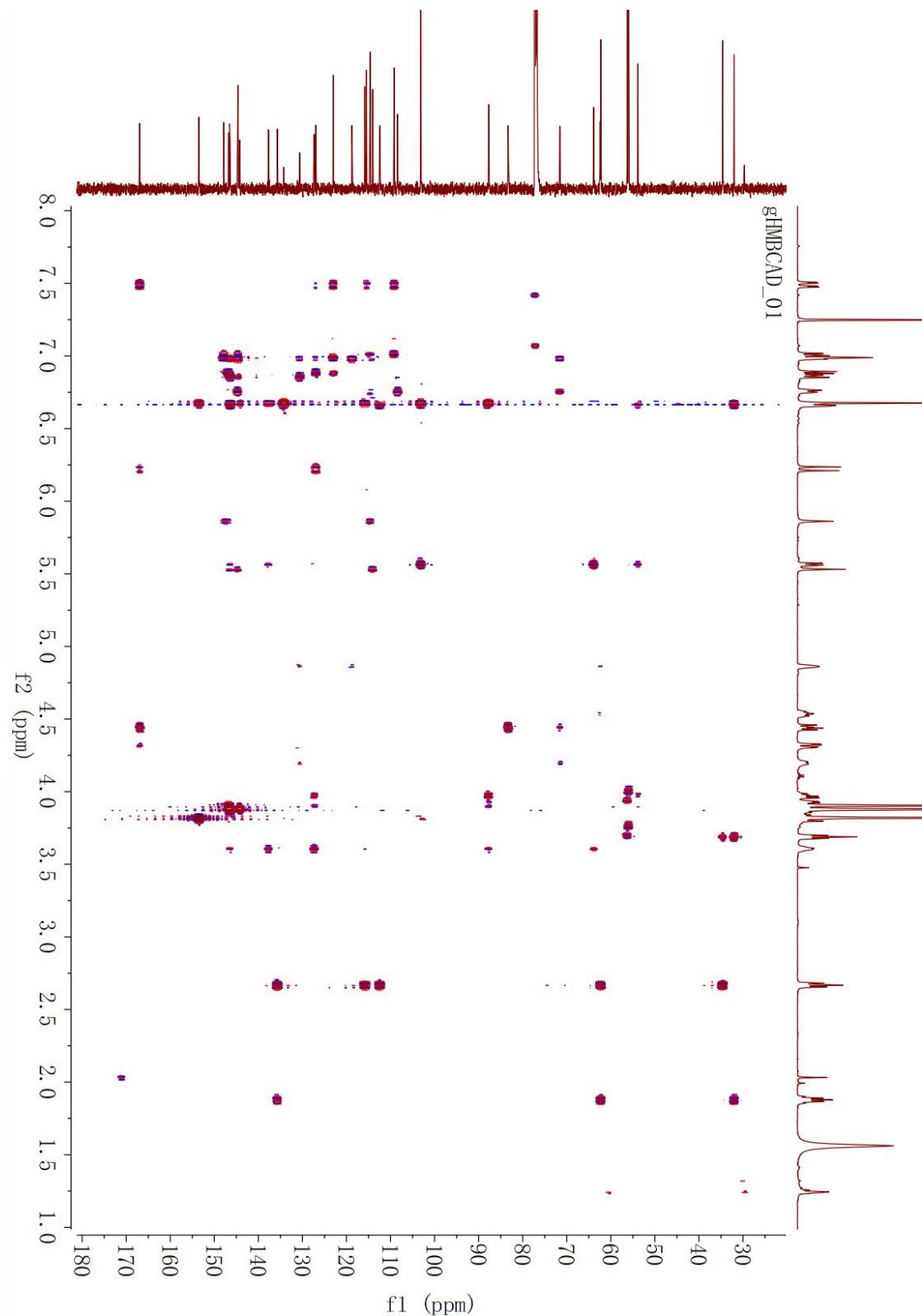
**Figure S7.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum (600 MHz) of bejolghotin A (**1**) in  $\text{CDCl}_3$



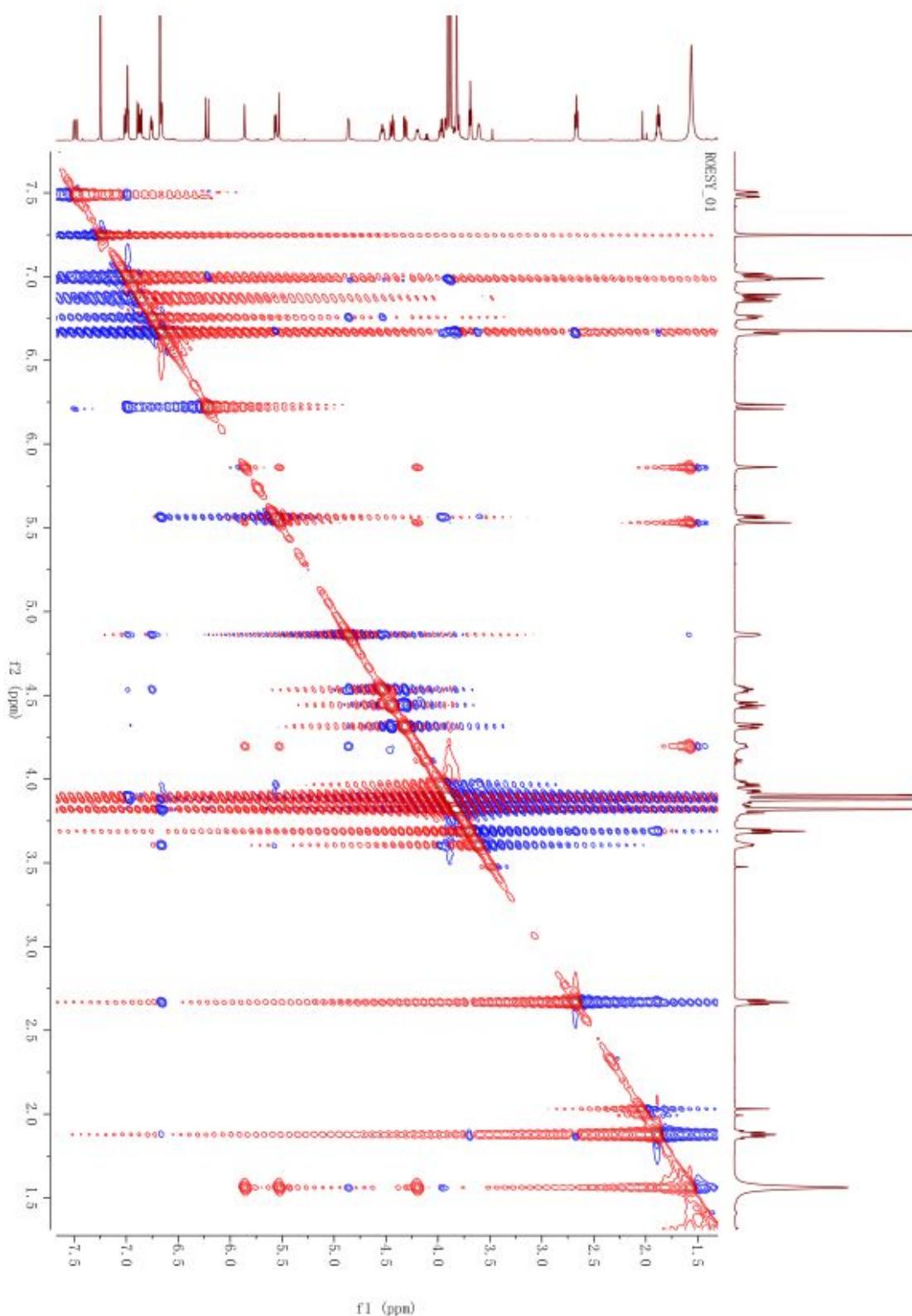
**Figure S8.** HSQC spectrum (600 MHz) of bejolghotin A (**1**) in  $\text{CDCl}_3$



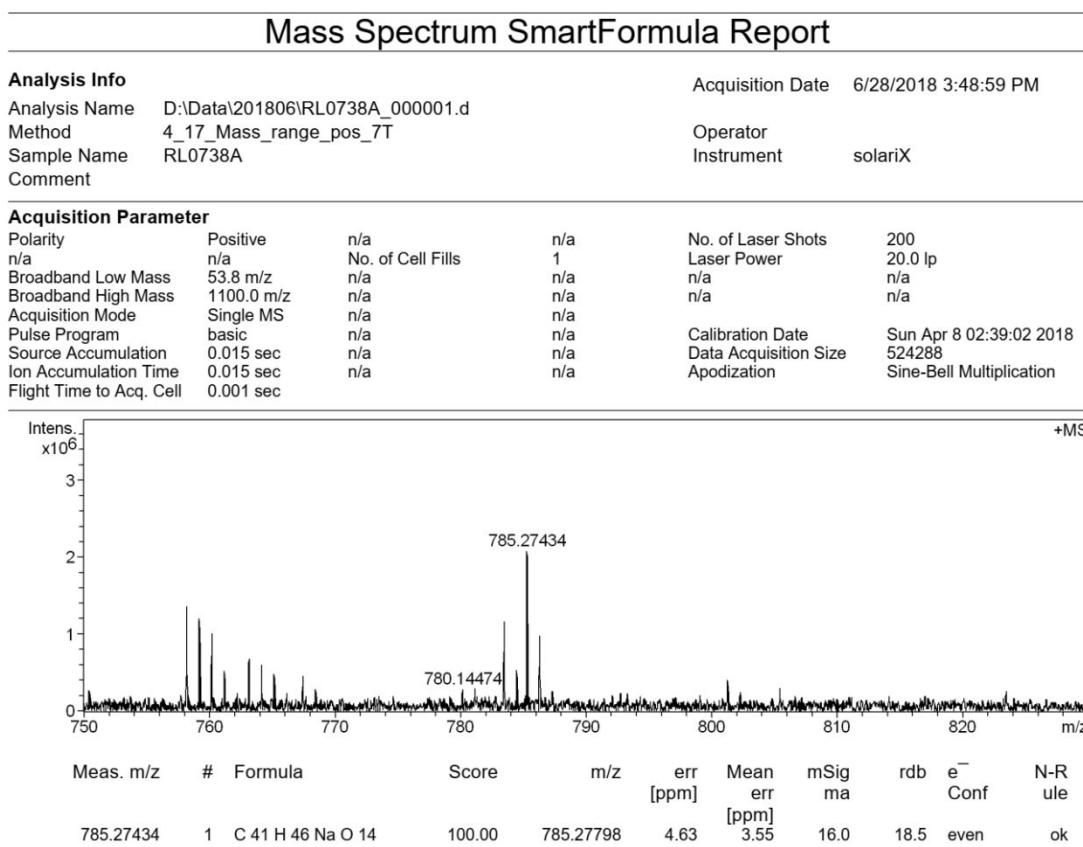
**Figure S9.** HMBC spectrum (600 MHz) of bejolghoton A (**1**) in  $\text{CDCl}_3$



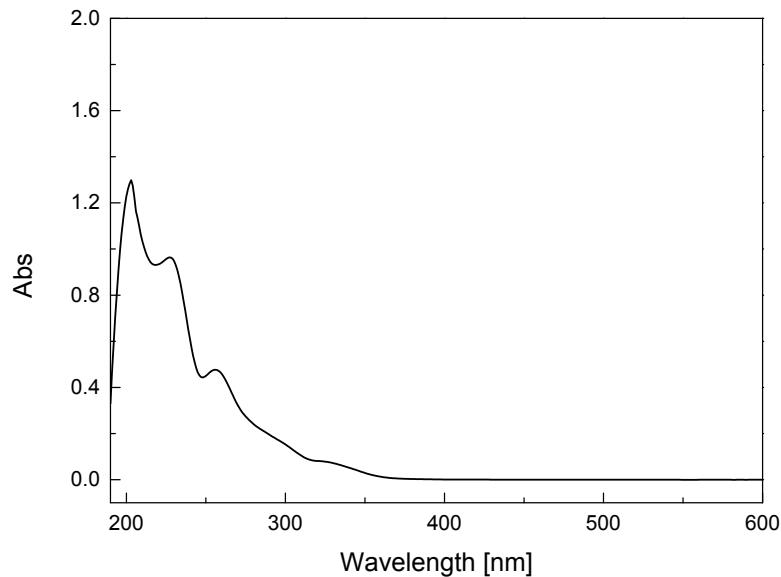
**Figure S10.** ROESY spectrum (600 MHz) of bezolghotin A (**1**) in  $\text{CDCl}_3$



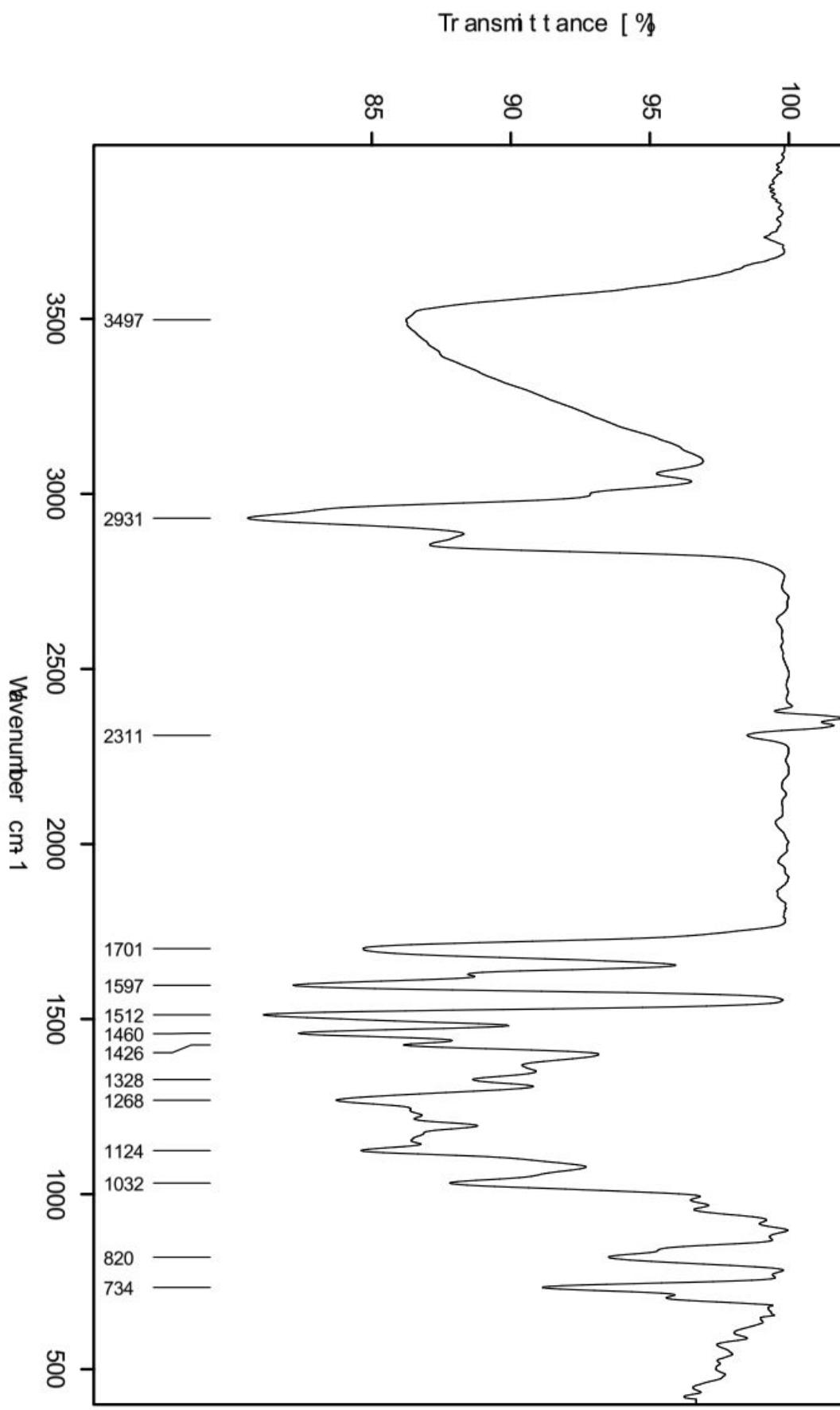
**Figure S11.** HRESIMS spectrum of bejolghotin A (**1**)



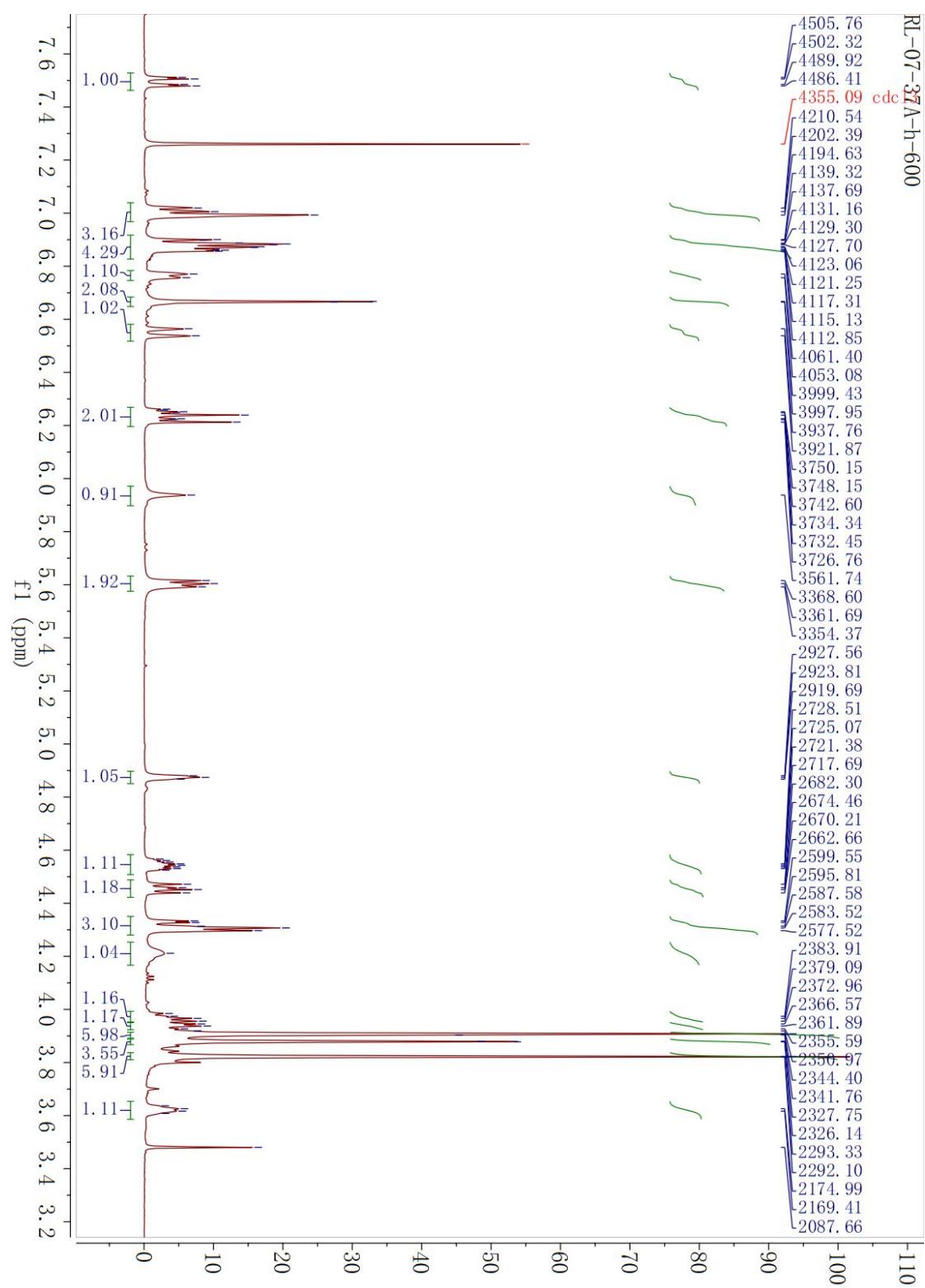
**Figure S12.** UV spectrum of bejolghotin A (**1**)



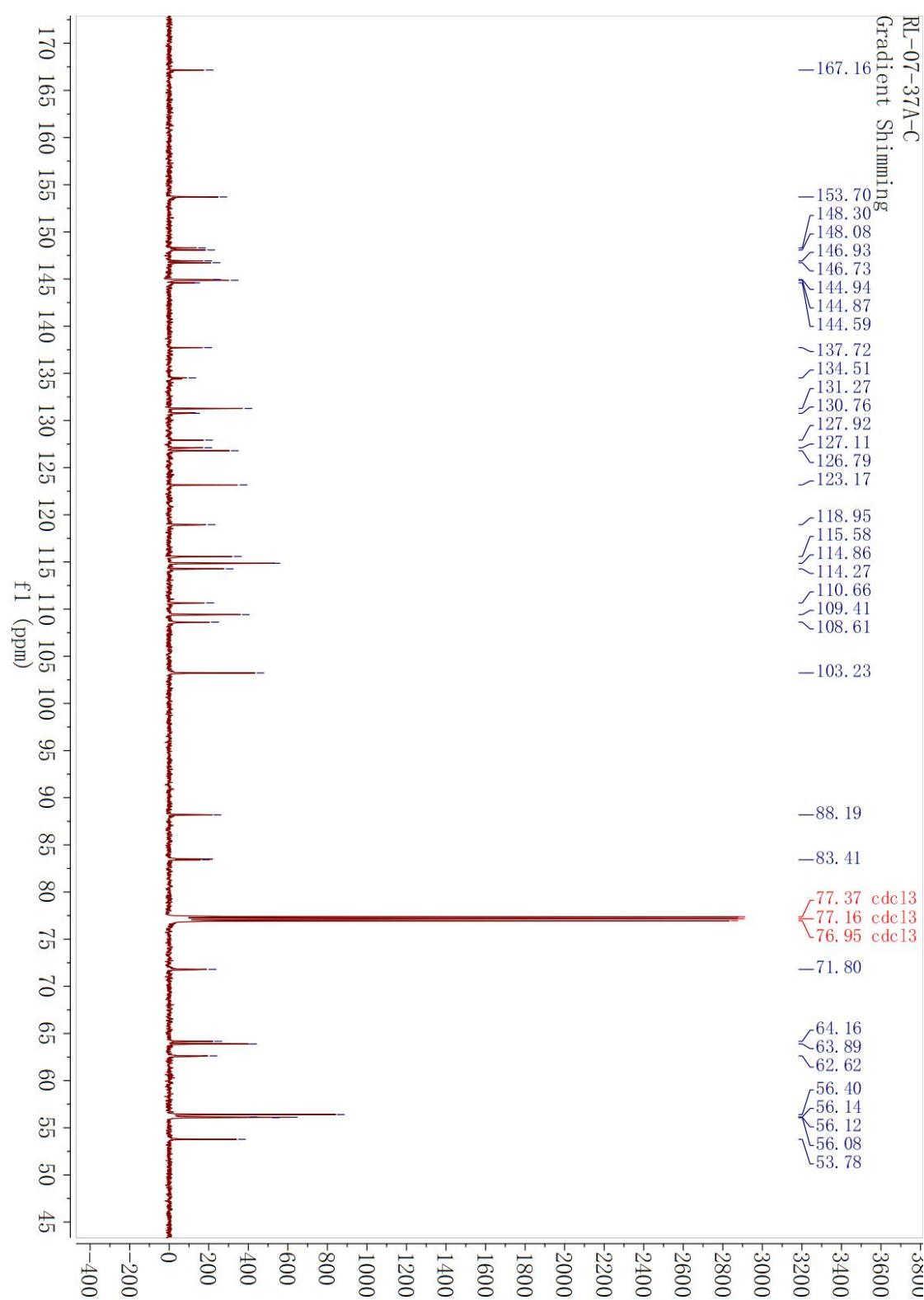
**Figure S13.** IR spectrum (KBr disc) of bejolghotin A (**1**)



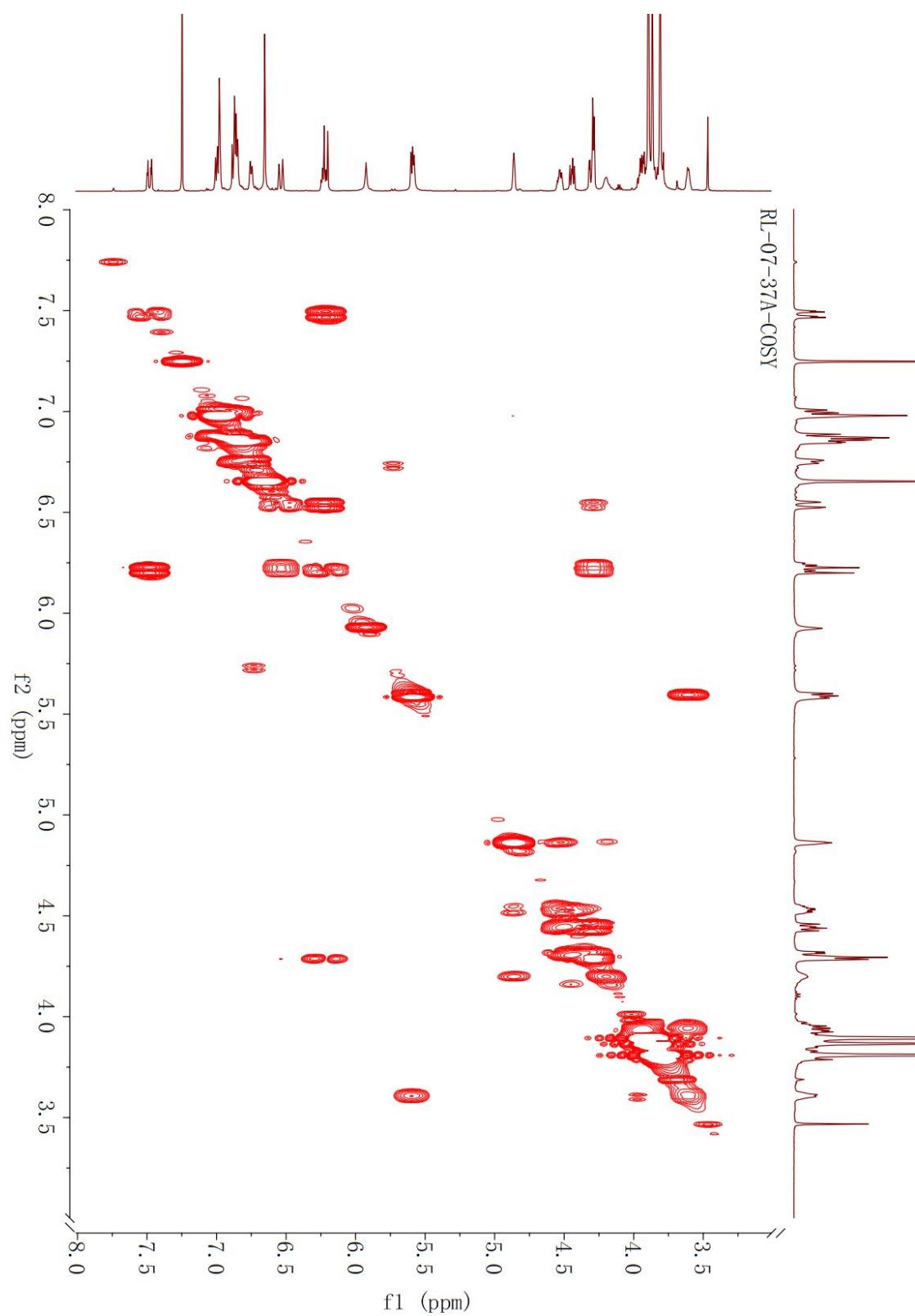
**Figure S14.**  $^1\text{H}$  NMR spectrum (600 MHz) of bejolghotin B (**2**) in  $\text{CDCl}_3$



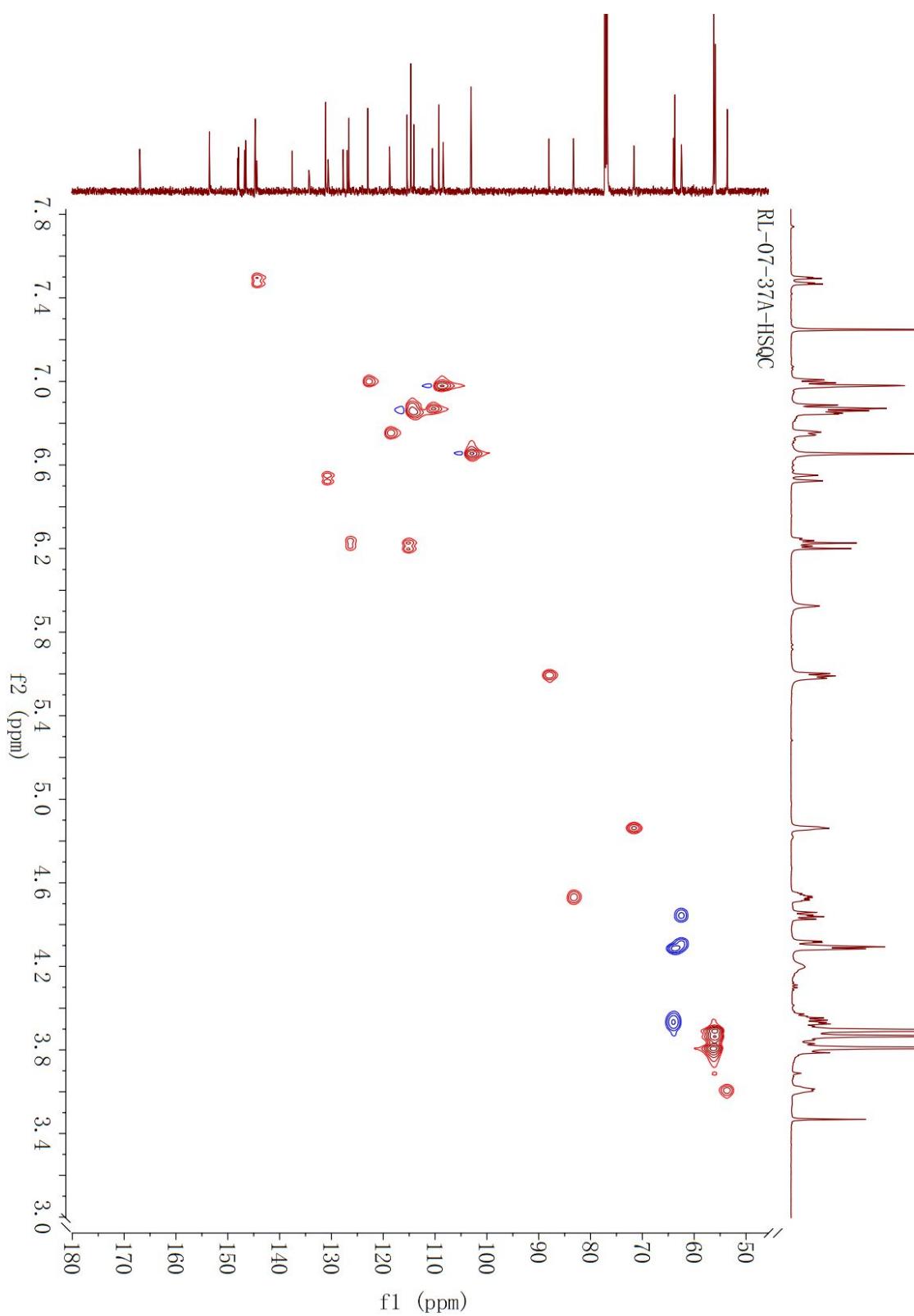
**Figure S15.**  $^{13}\text{C}$  NMR spectrum (150 MHz) of bejolghotin B (**2**) in  $\text{CDCl}_3$



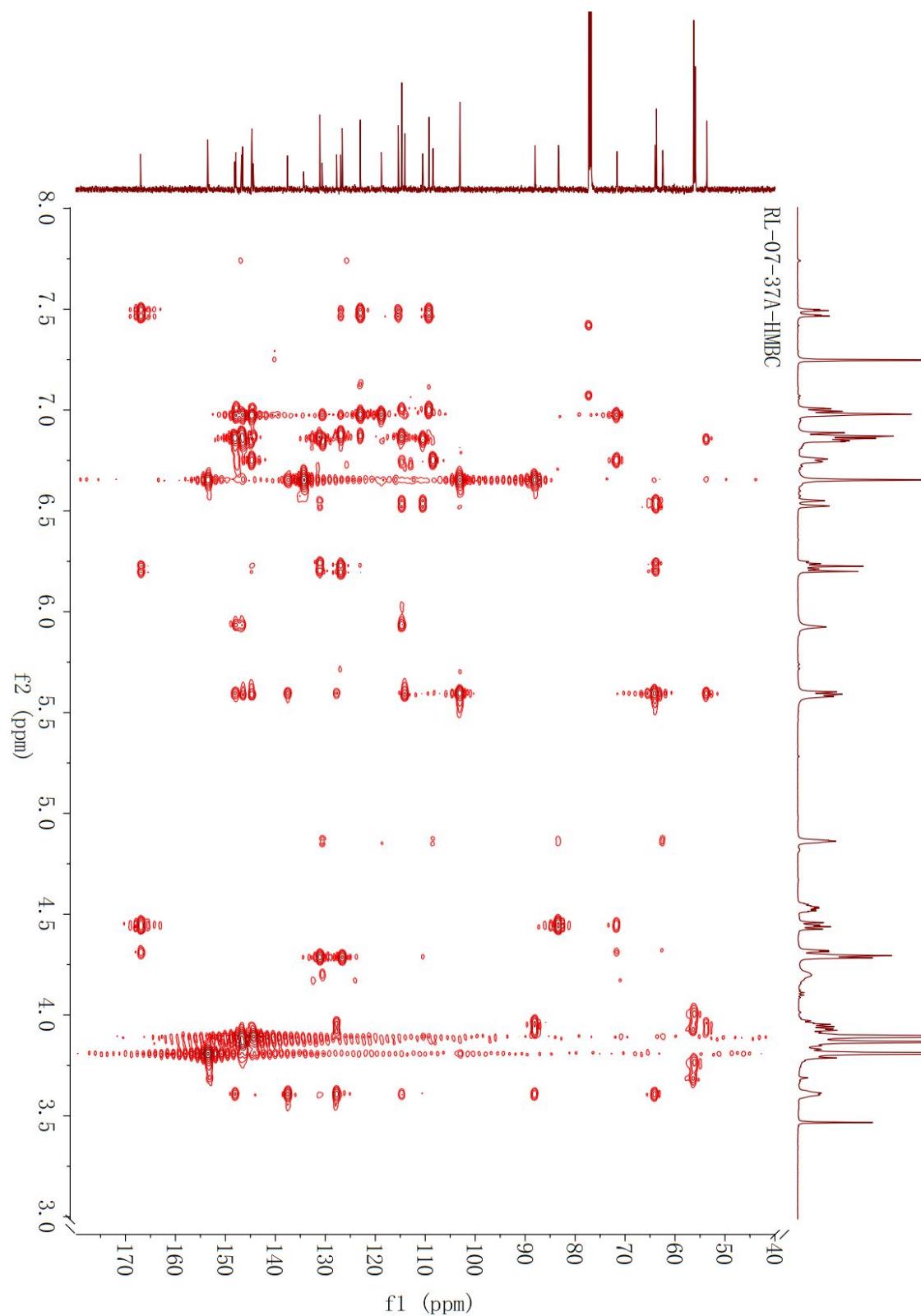
**Figure S16.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum (600 MHz) of bejolghotin B (**2**) in  $\text{CDCl}_3$



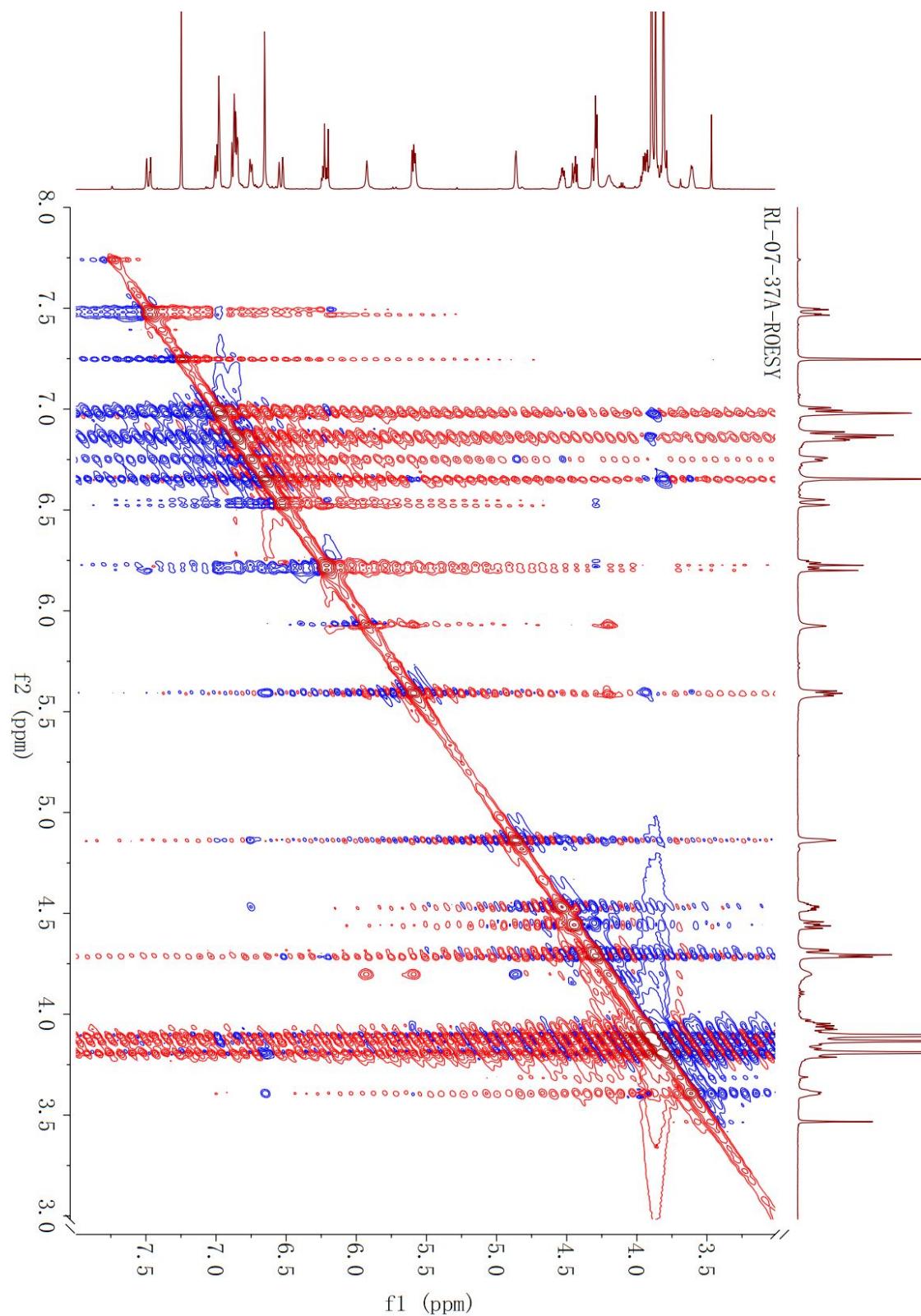
**Figure S17.** HSQC spectrum (600 MHz) of bejolghotin B (**2**) in  $\text{CDCl}_3$



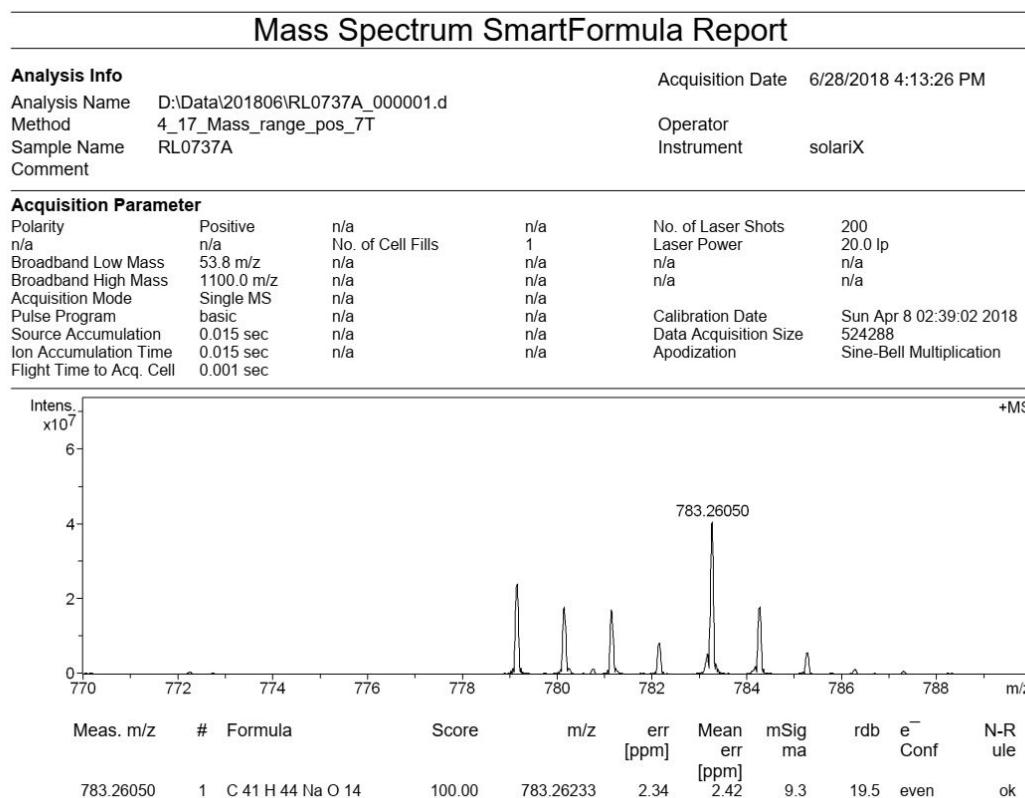
**Figure S18.** HMBC spectrum (600 MHz) of bejolghotin B (**2**) in  $\text{CDCl}_3$



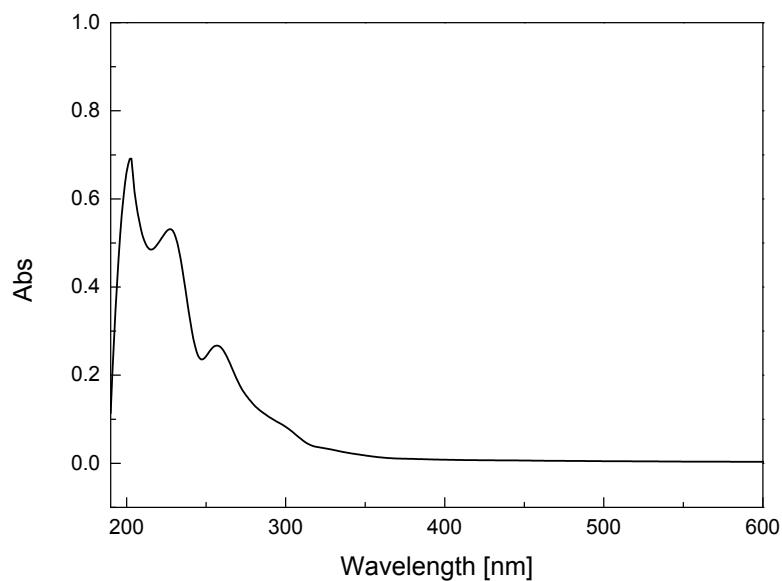
**Figure S19.** ROESY spectrum (600 MHz) of bejolghotin B (**2**) in  $\text{CDCl}_3$



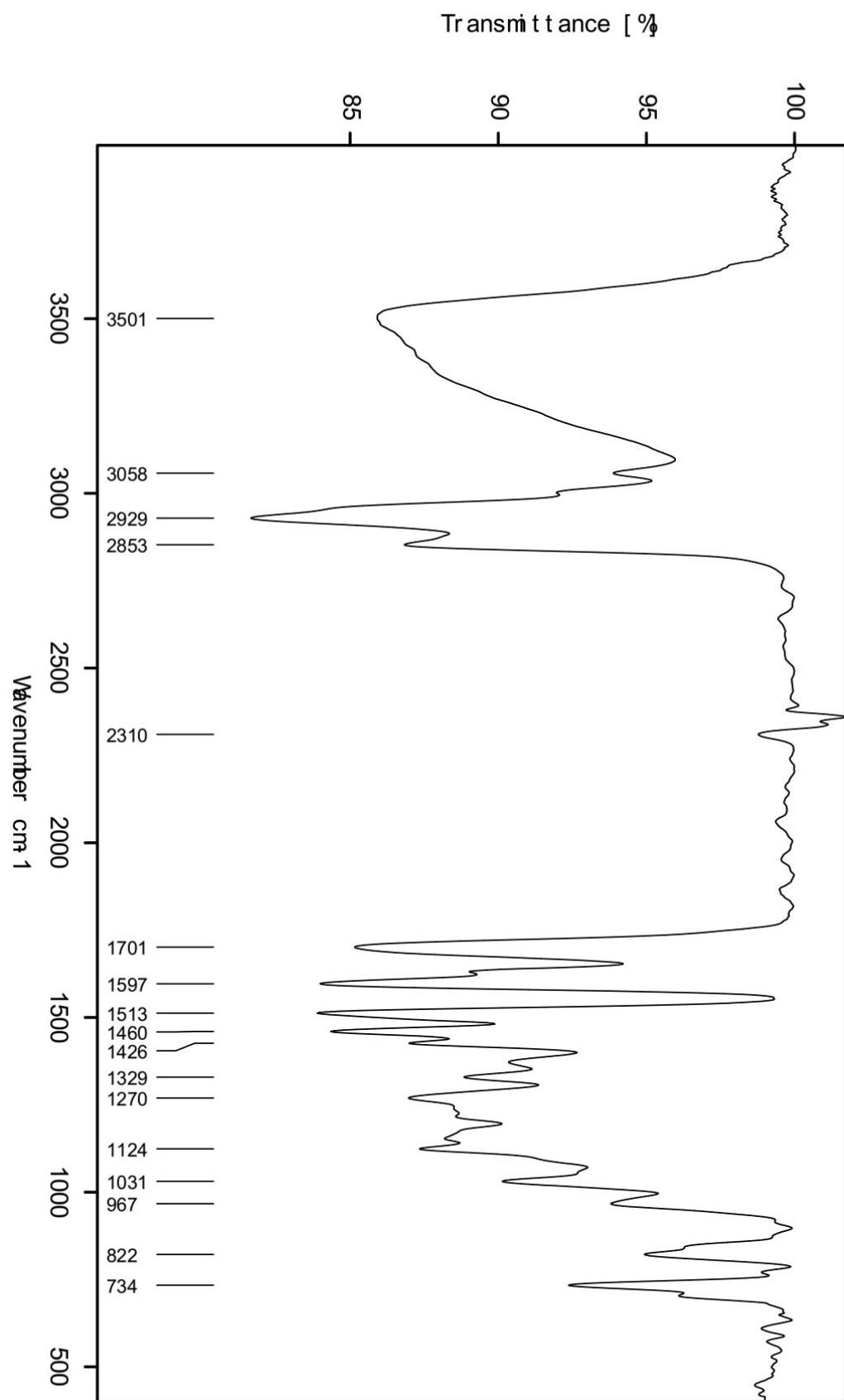
**Figure S20.** HRESIMS spectrum of bejolghotin B (2)



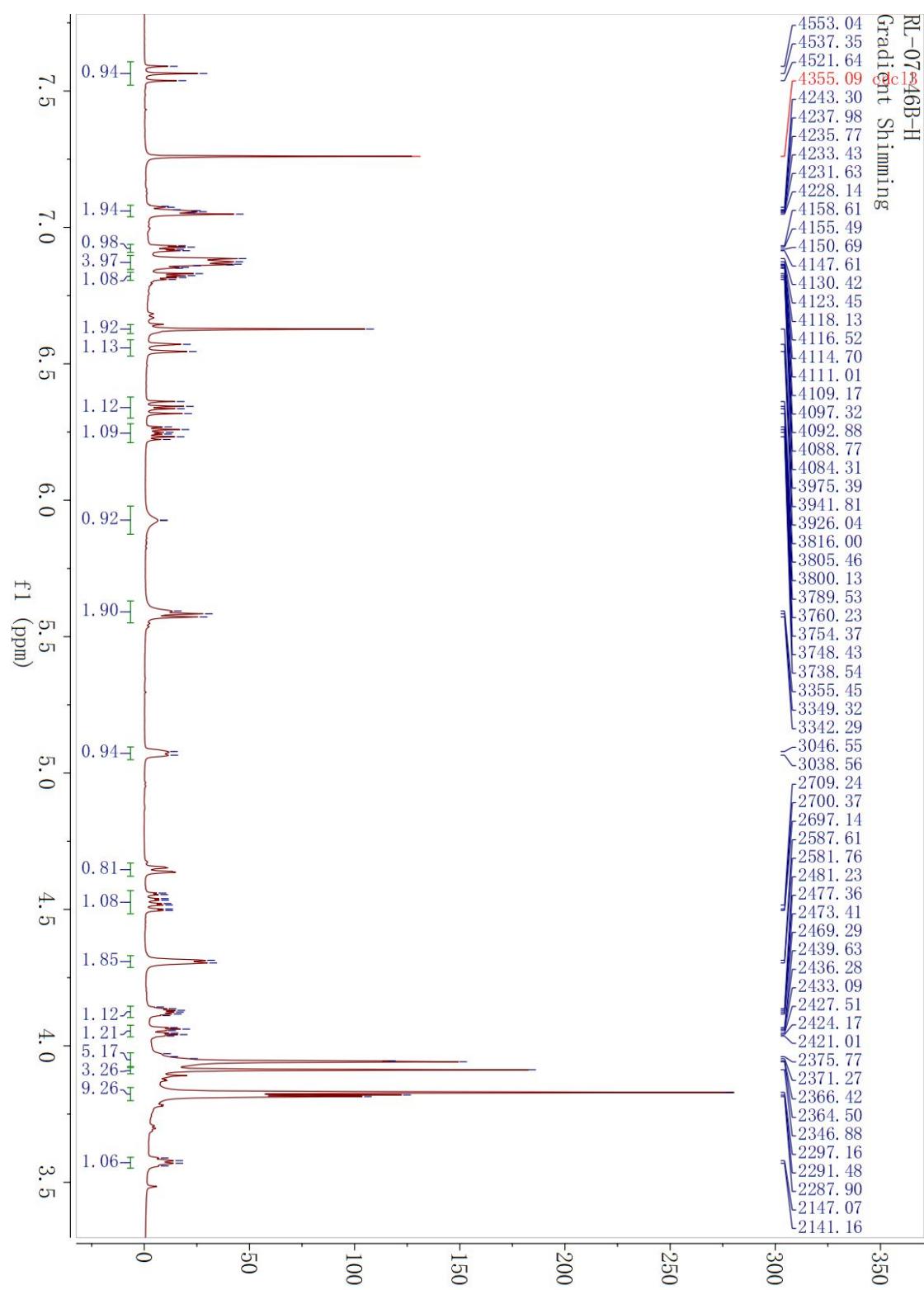
**Figure S21.** UV spectrum of bejolghotin B (2)



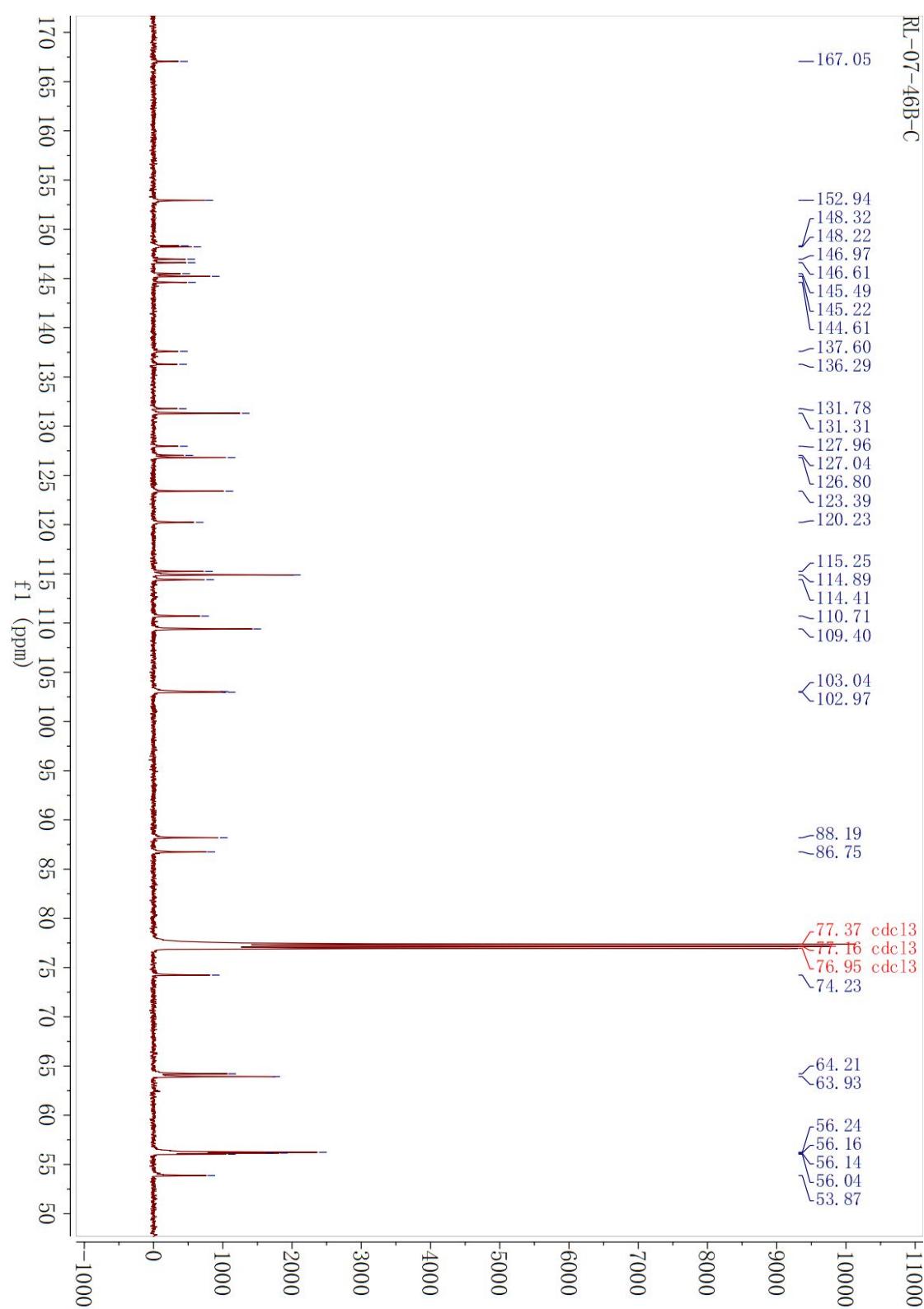
**Figure S22.** IR spectrum (KBr disc) of bejolghotin B (**2**)



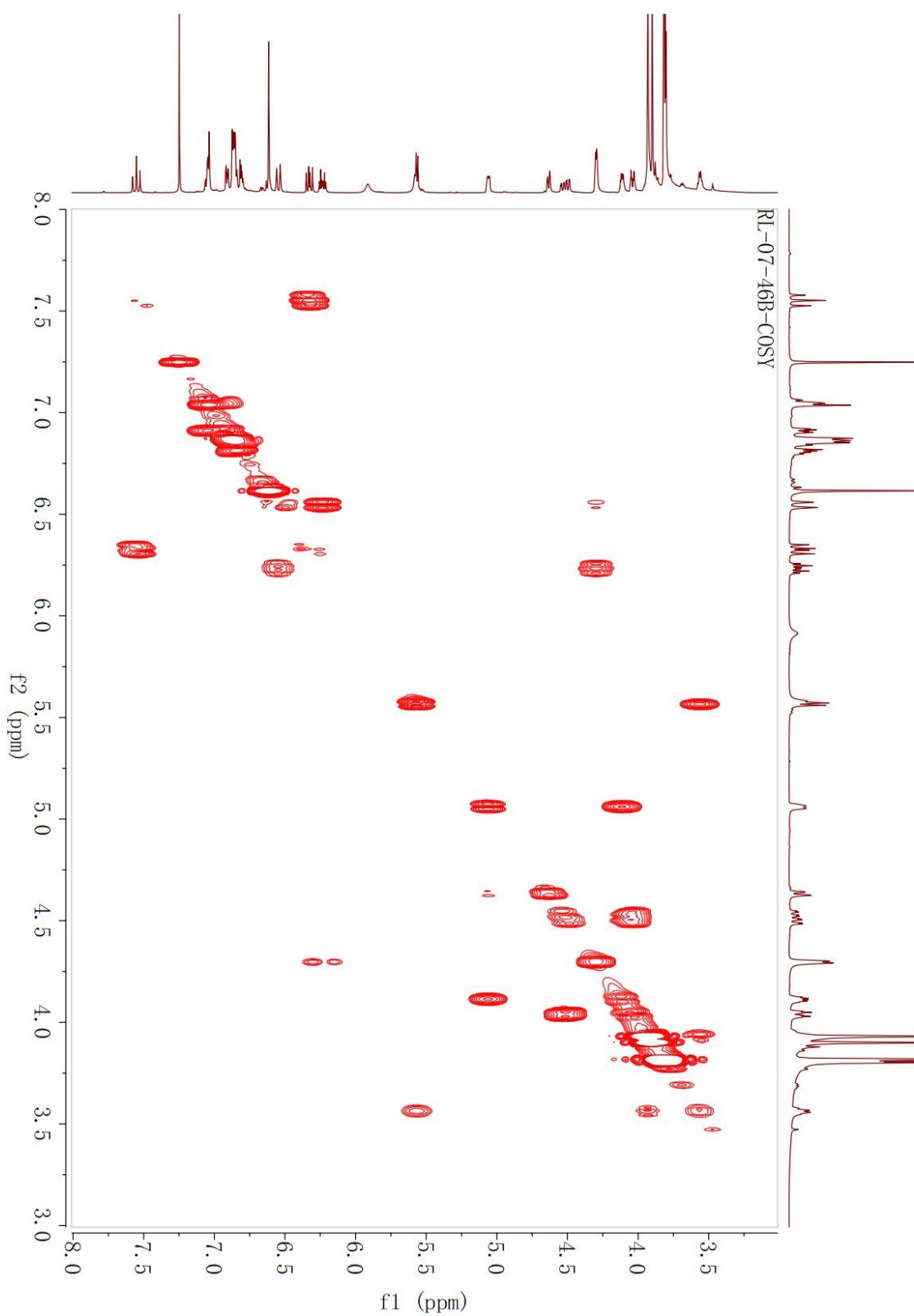
**Figure S23.**  $^1\text{H}$  NMR spectrum (600 MHz) of bejolghotin C (**3**) in  $\text{CDCl}_3$



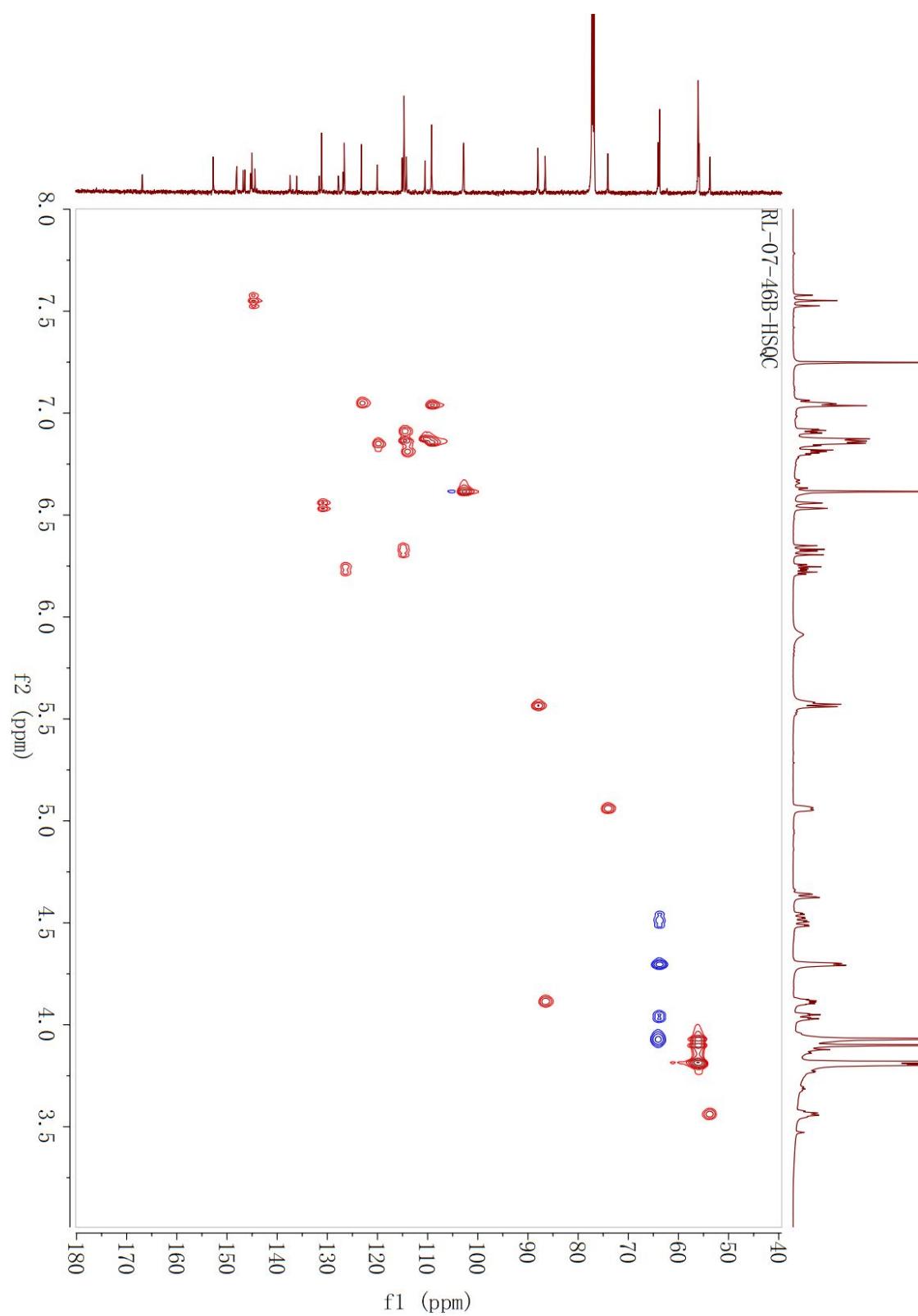
**Figure S24.**  $^{13}\text{C}$  NMR spectrum (150 MHz) of bejolghotin C (**3**) in  $\text{CDCl}_3$



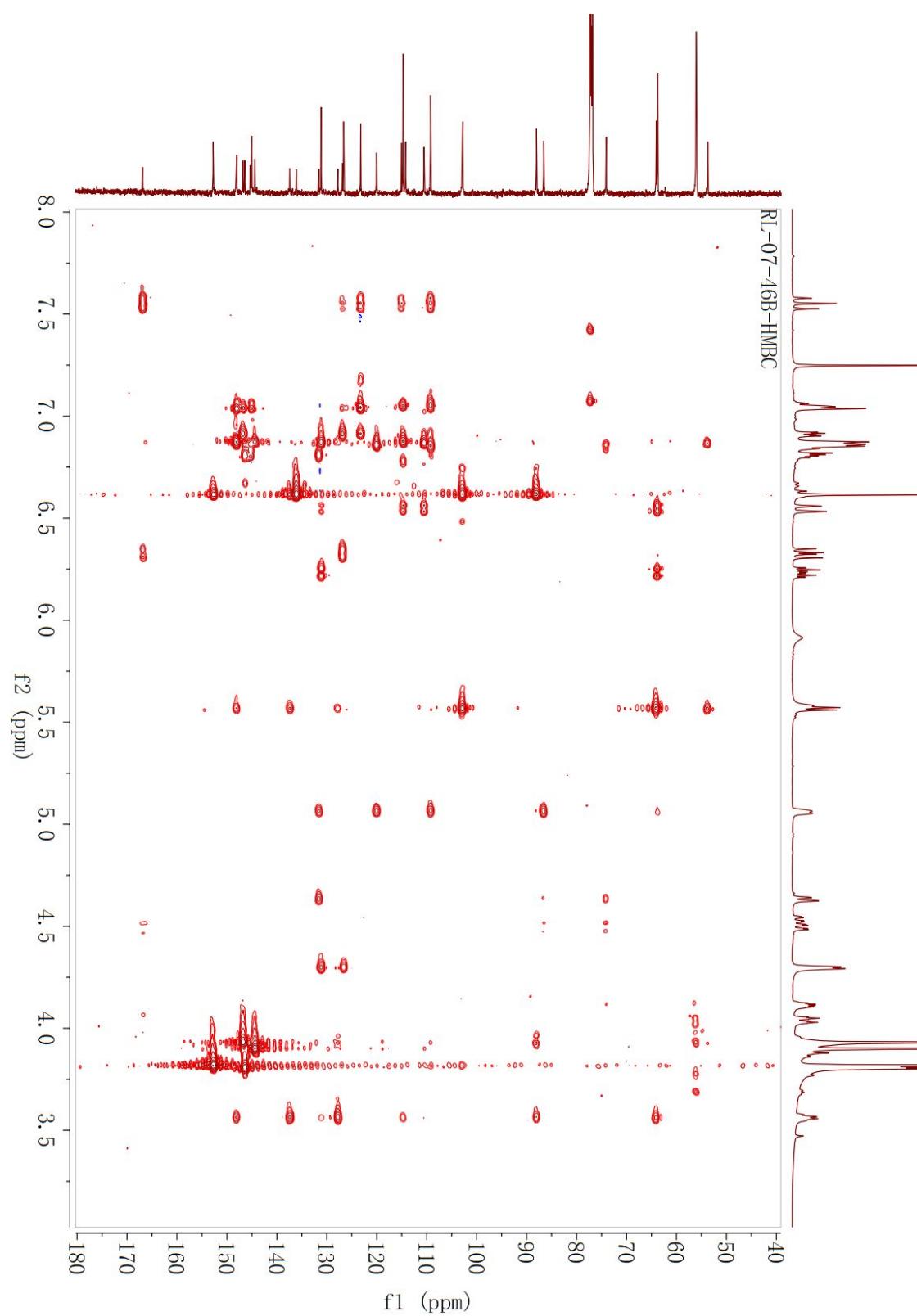
**Figure S25.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum (600 MHz) of bejolghotin C (**3**) in  $\text{CDCl}_3$



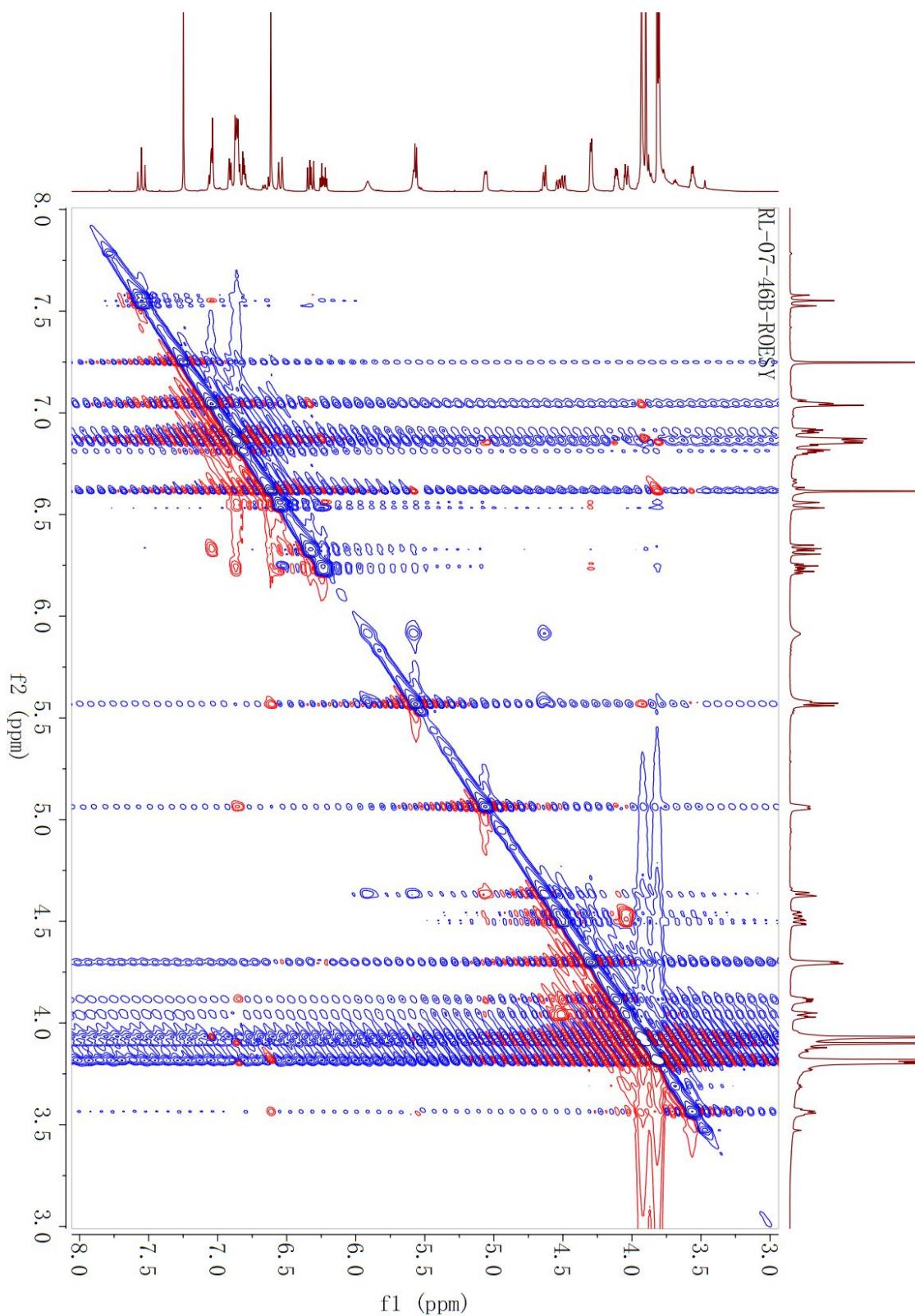
**Figure S26.** HSQC spectrum (600 MHz) of bejolghotin C (**3**) in  $\text{CDCl}_3$



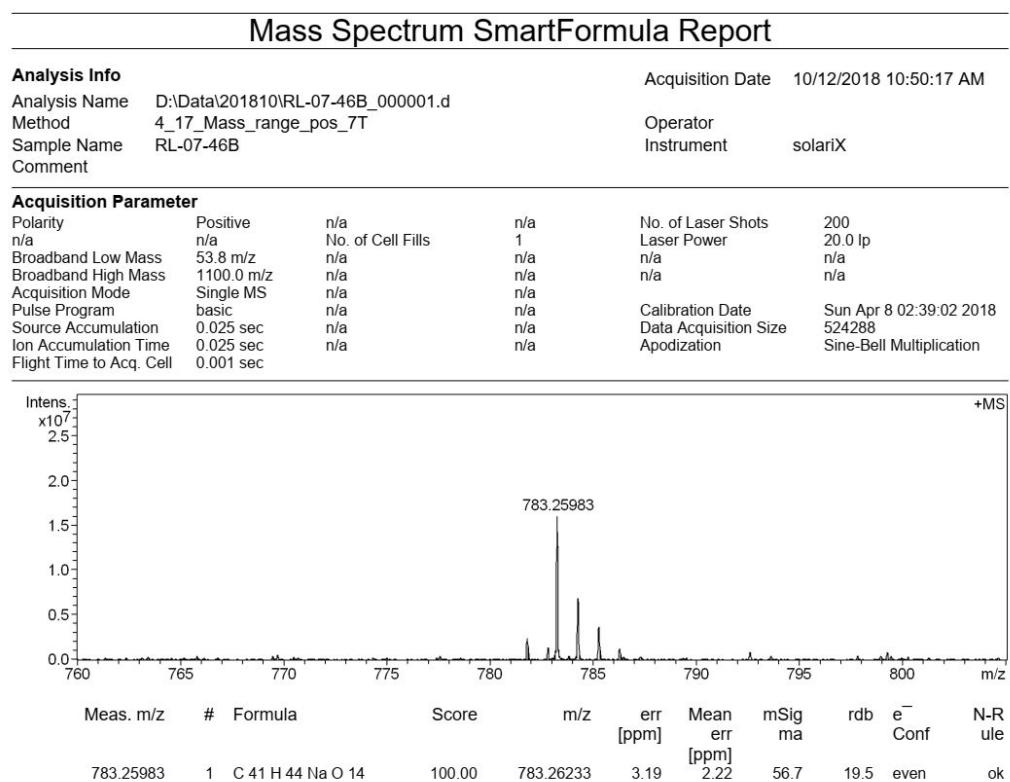
**Figure S27.** HMBC spectrum (600 MHz) of bejolghotin C (**3**) in  $\text{CDCl}_3$



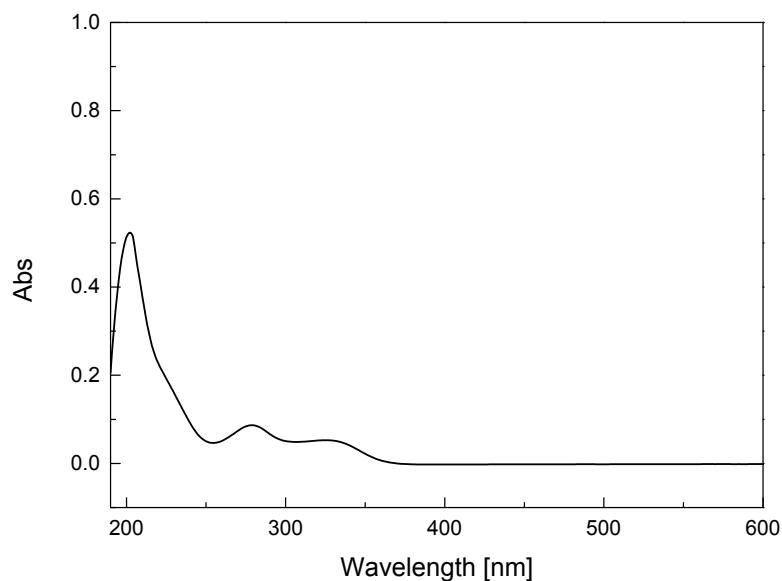
**Figure S28.** ROESY spectrum (600 MHz) of bejolghotin C (**3**) in  $\text{CDCl}_3$



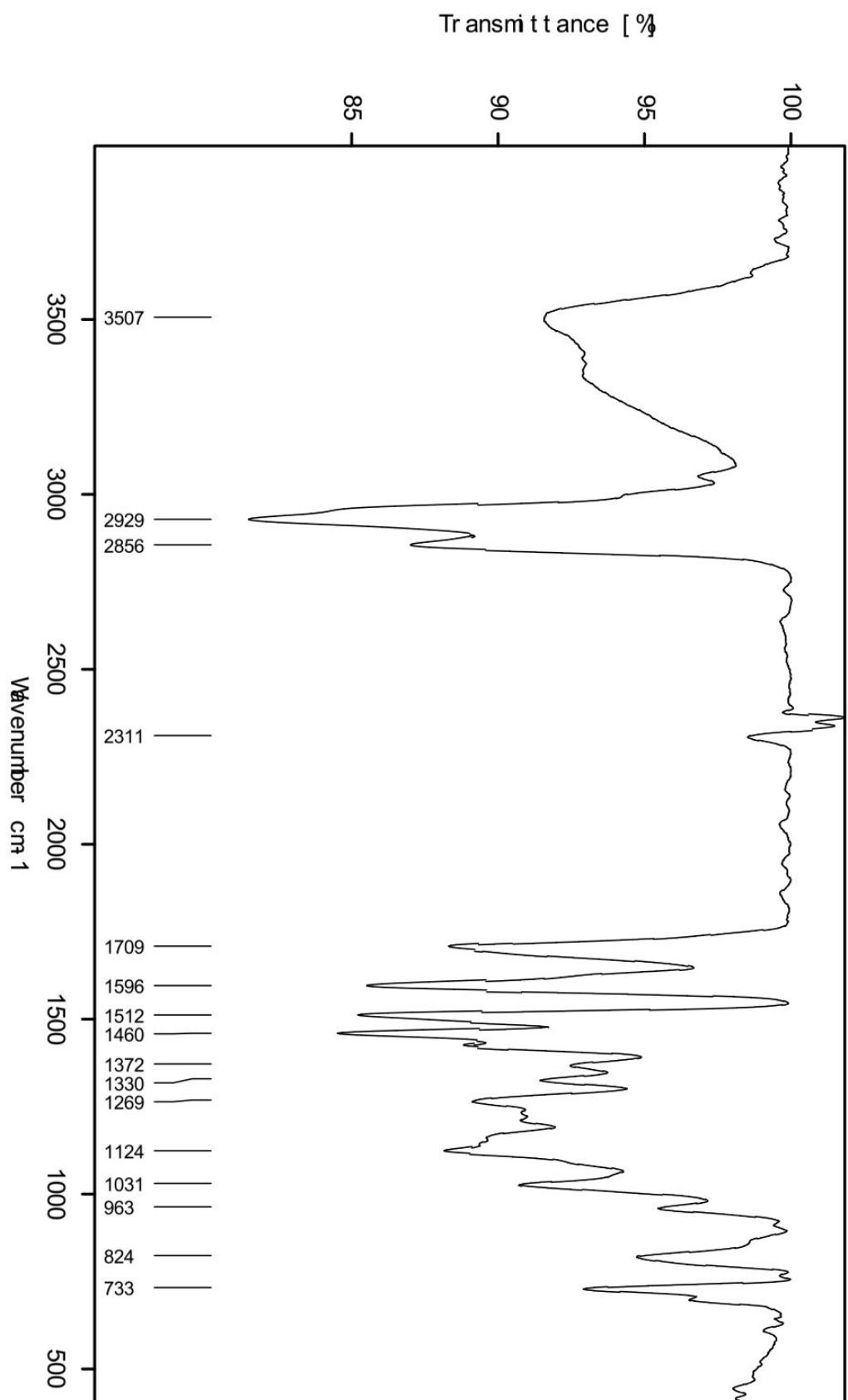
**Figure S29.** HRESIMS spectrum of bejolghotin C (**3**)



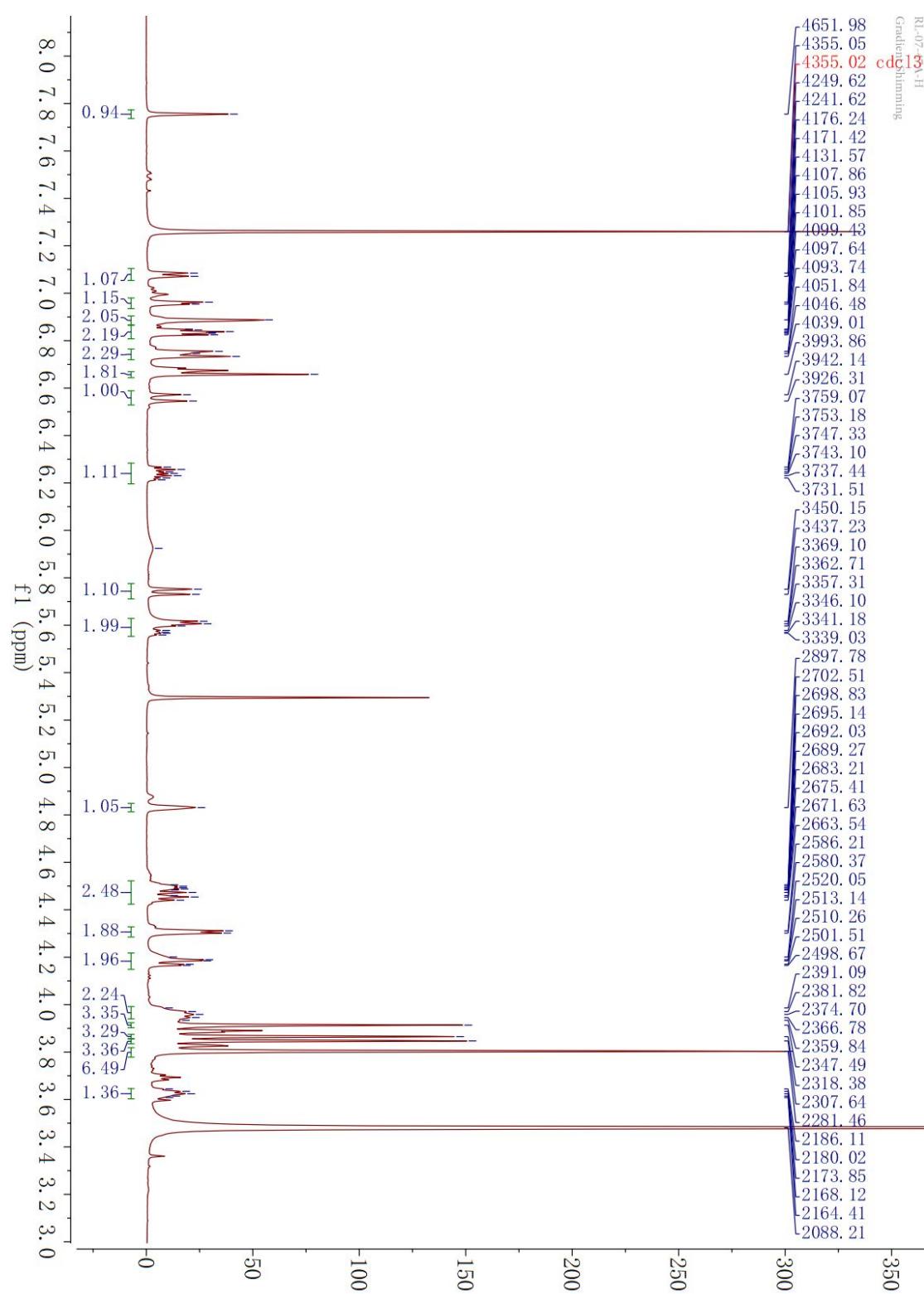
**Figure S30.** UV spectrum of bejolghotin C (**3**)



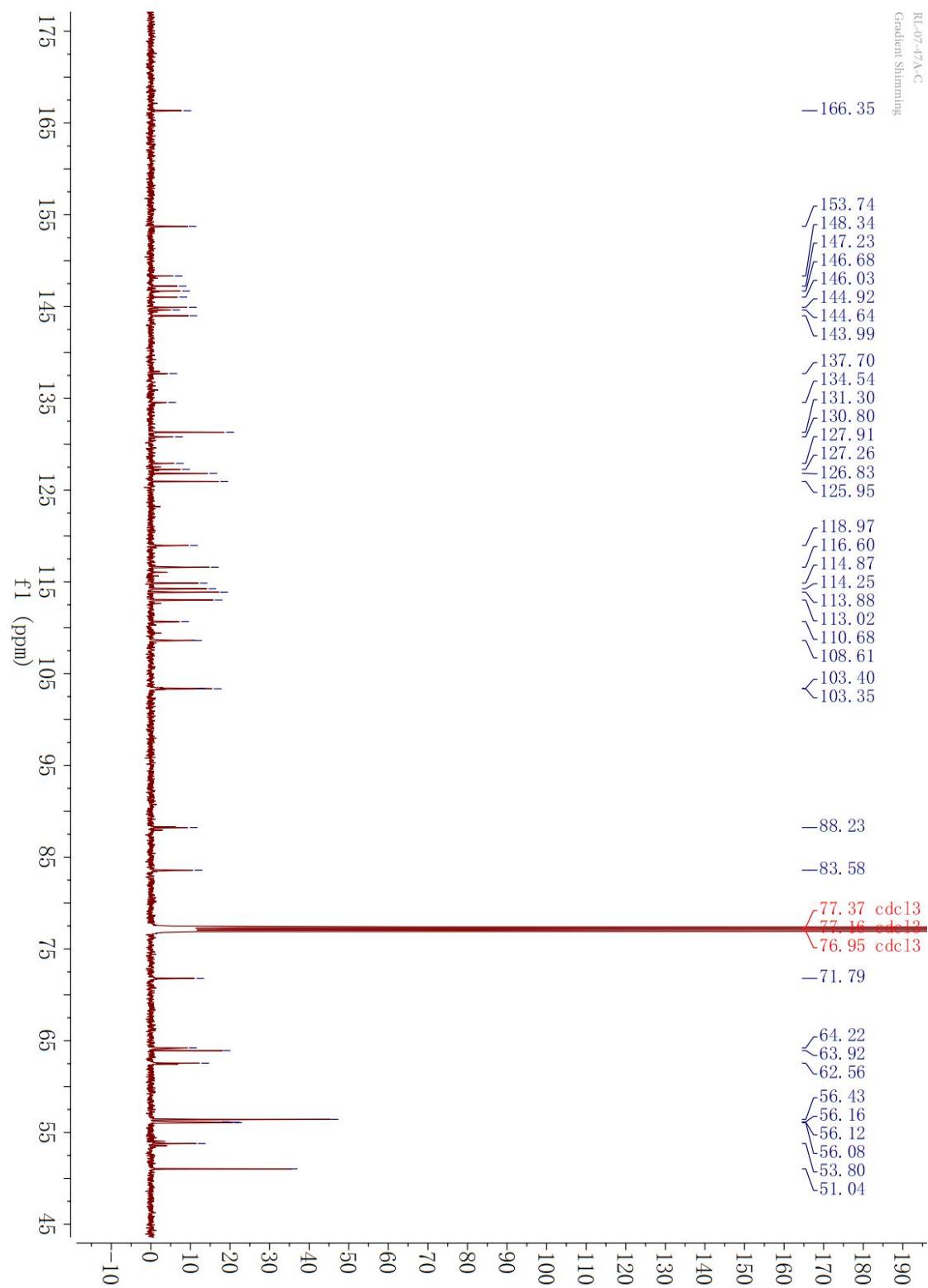
**Figure S31.** IR spectrum (KBr disc) of bejolghotin C (**3**)



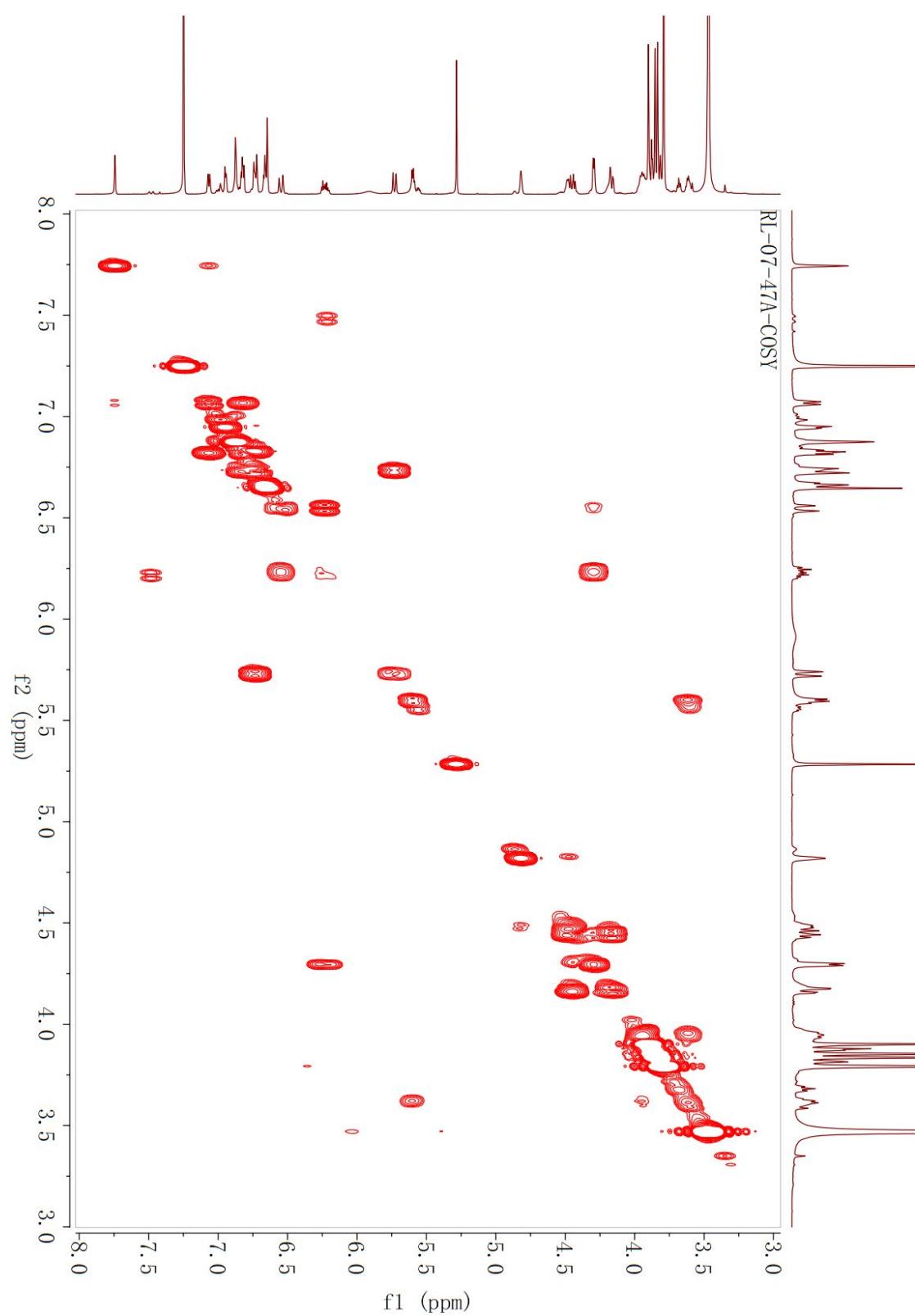
**Figure S32.**  $^1\text{H}$  NMR spectrum (600 MHz) of bejolghotin D (**4**) in  $\text{CDCl}_3$



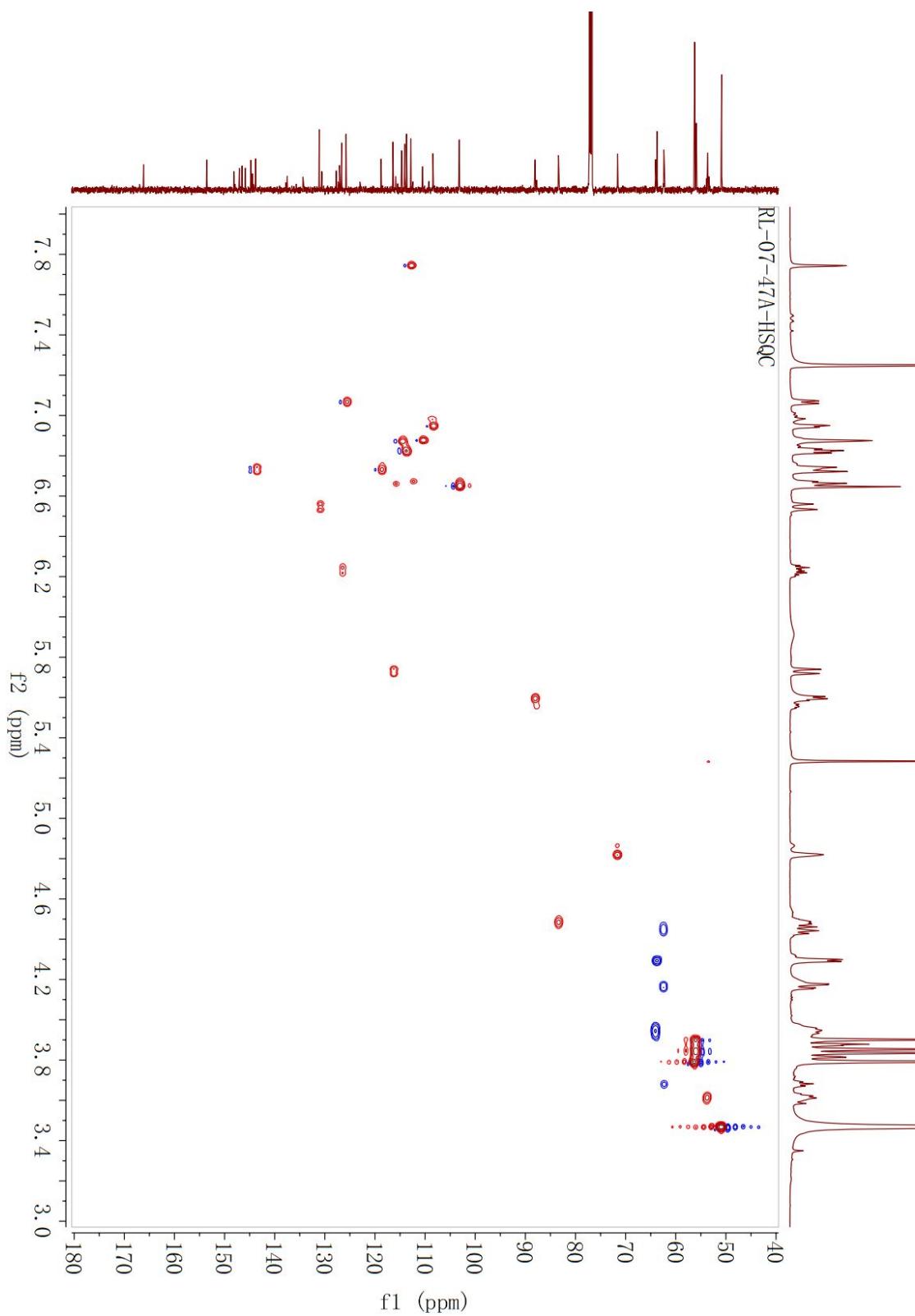
**Figure S33.**  $^{13}\text{C}$  NMR spectrum (150 MHz) of bejolghotin D (**4**) in  $\text{CDCl}_3$



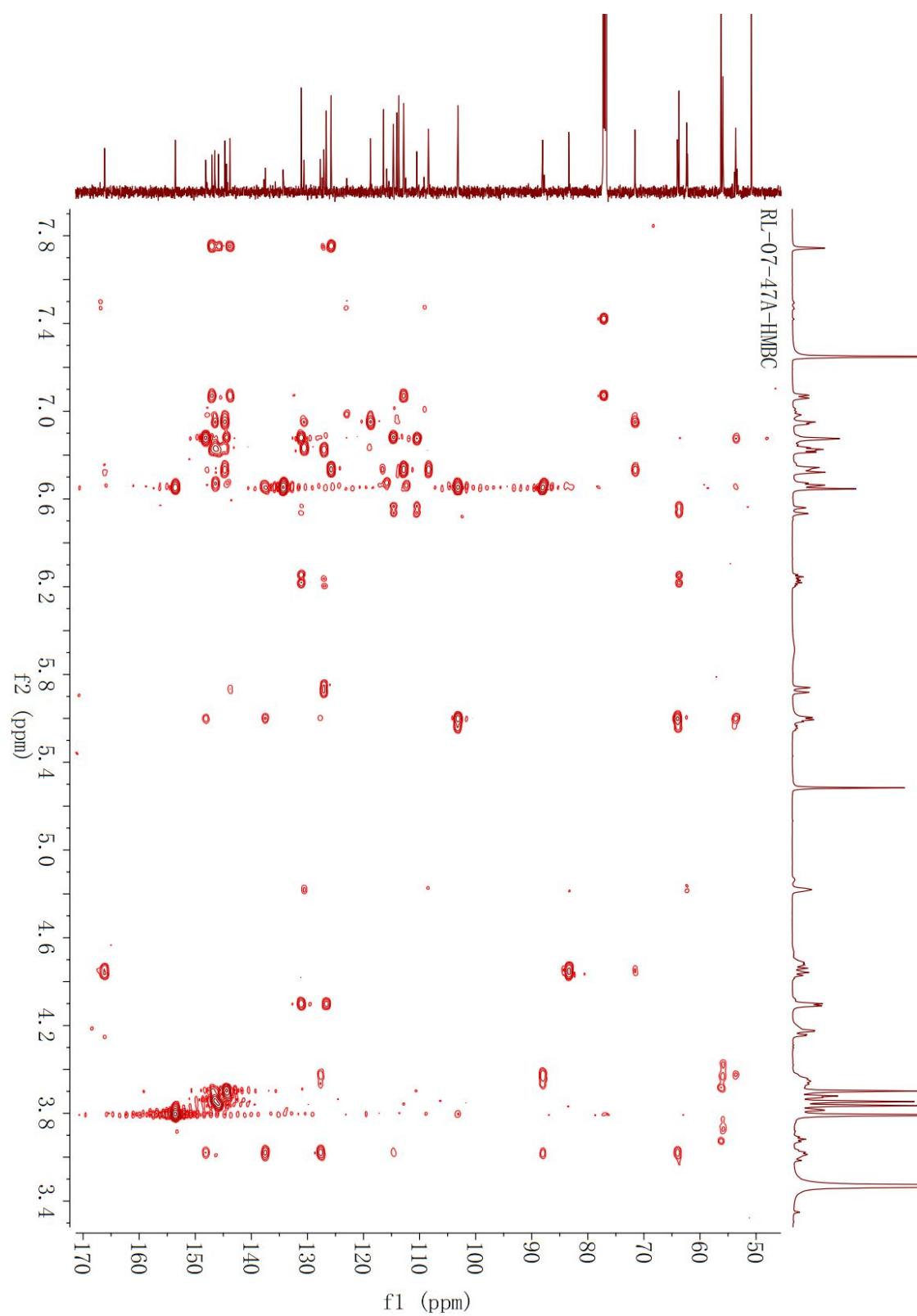
**Figure S34.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum (600 MHz) of bejolghotin D (**4**) in  $\text{CDCl}_3$



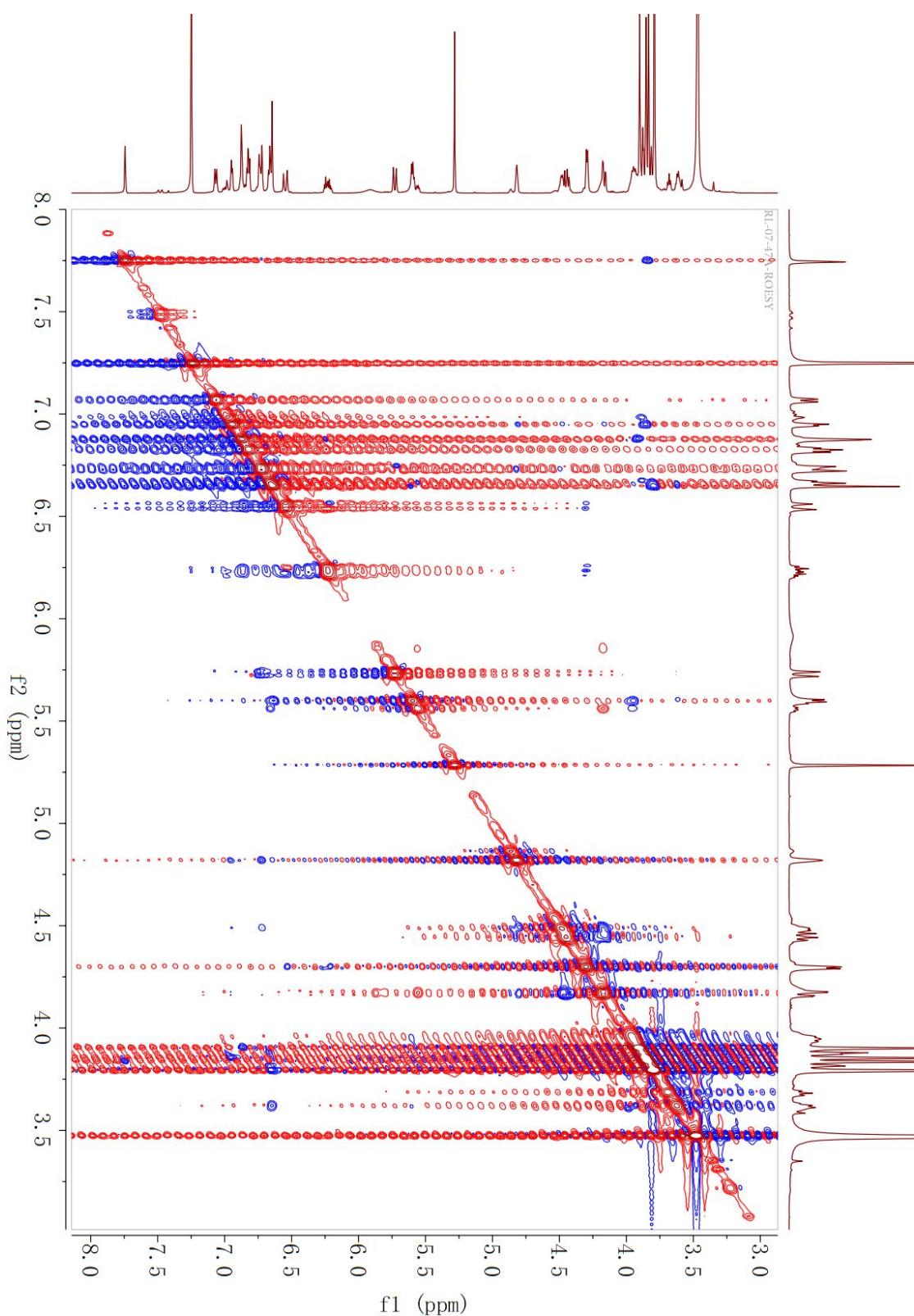
**Figure S35.** HSQC spectrum (600 MHz) of bejolghotin D (**4**) in  $\text{CDCl}_3$



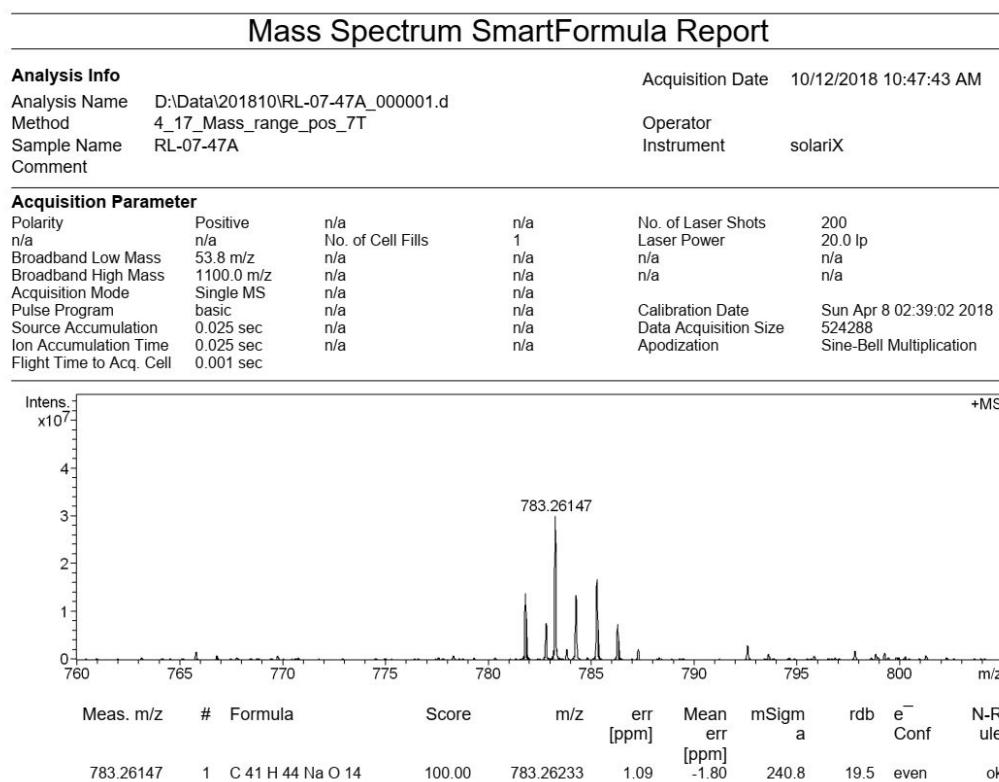
**Figure S36.** HMBC spectrum (600 MHz) of bejolghotin D (**4**) in  $\text{CDCl}_3$



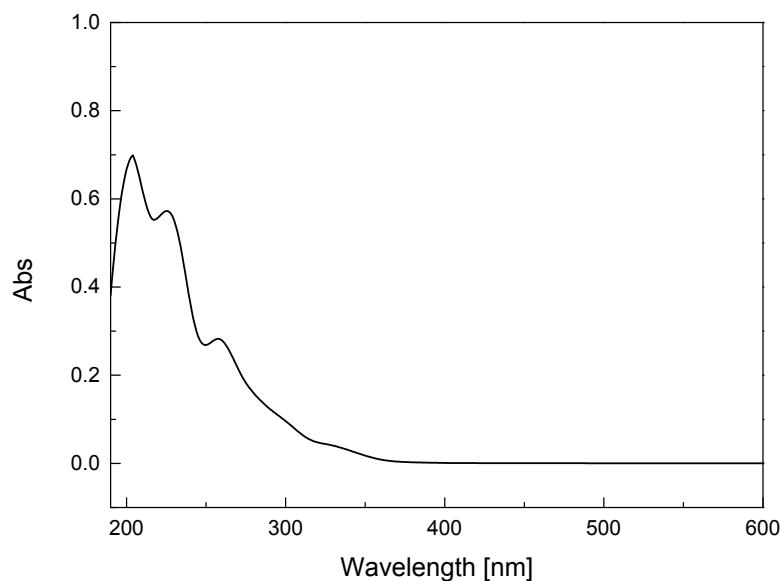
**Figure S37.** ROESY spectrum (600 MHz) of bejolghotin D (**4**) in  $\text{CDCl}_3$



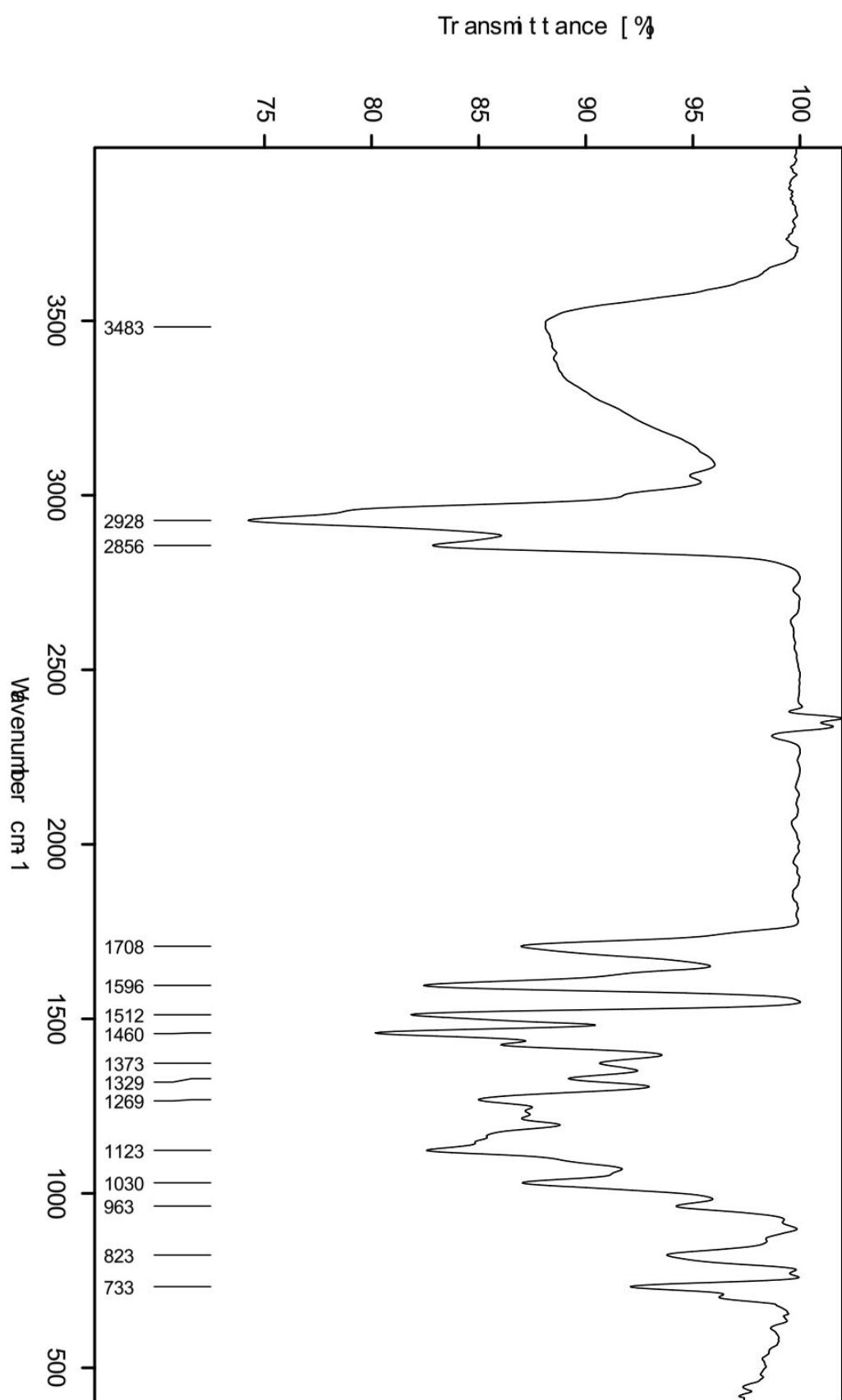
**Figure S38.** HRESIMS spectrum of bejolghotin D (**4**)



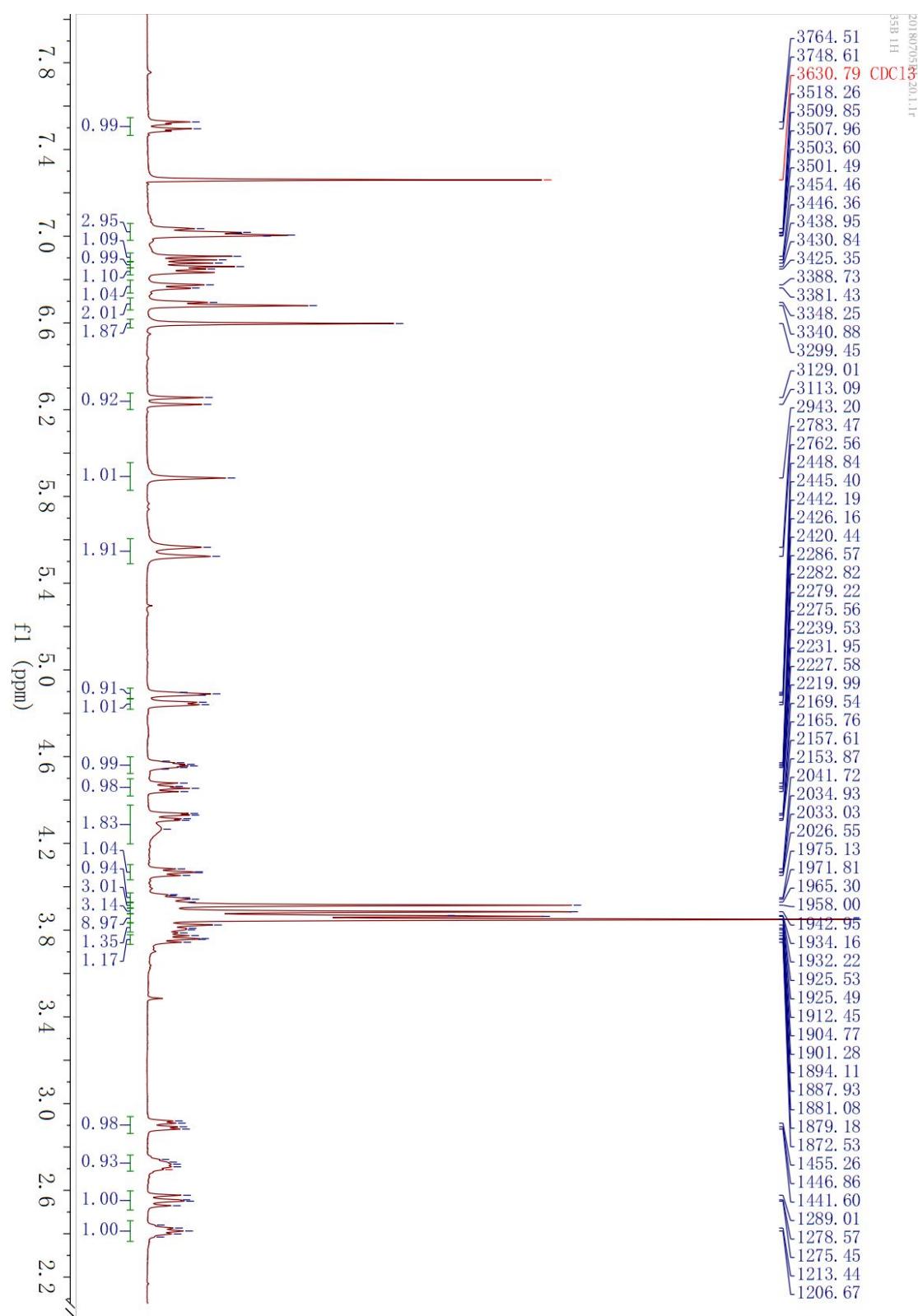
**Figure S39.** UV spectrum of bejolghotin D (**4**)



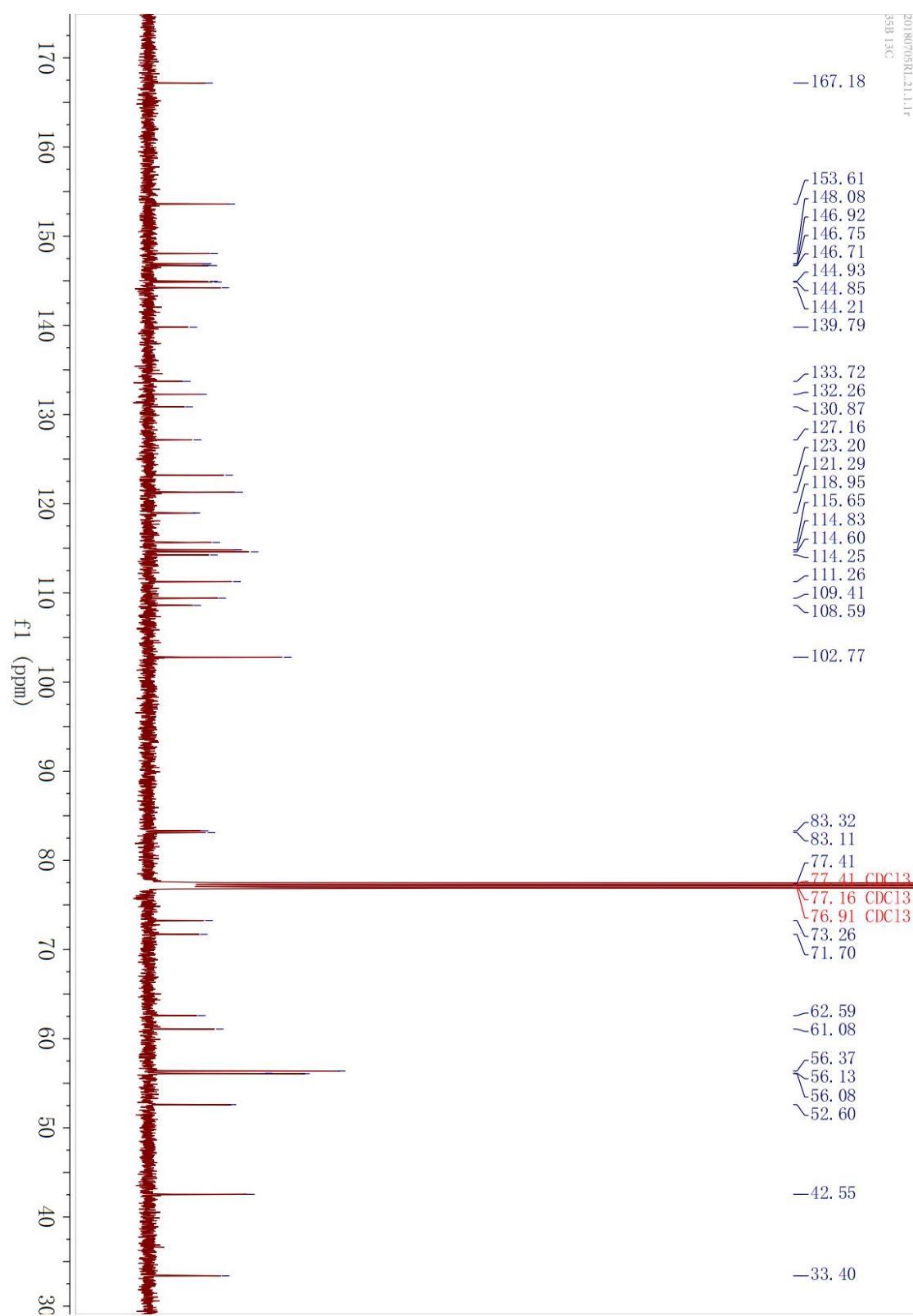
**Figure S40.** IR spectrum (KBr disc) of bejolghotin D (**4**)



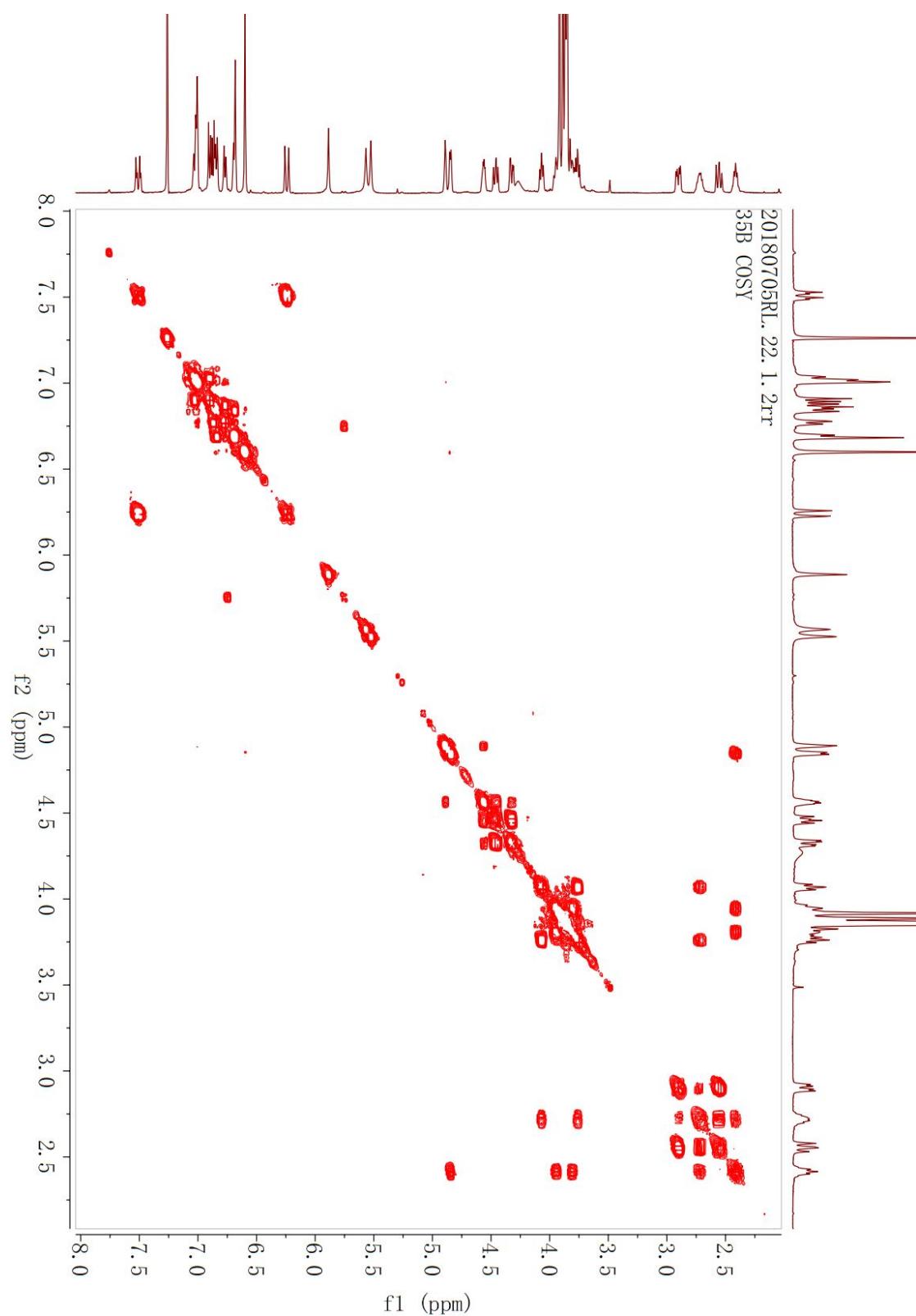
**Figure S41.**  $^1\text{H}$  NMR spectrum (600 MHz) of bejolghotin E (**9**) in  $\text{CDCl}_3$



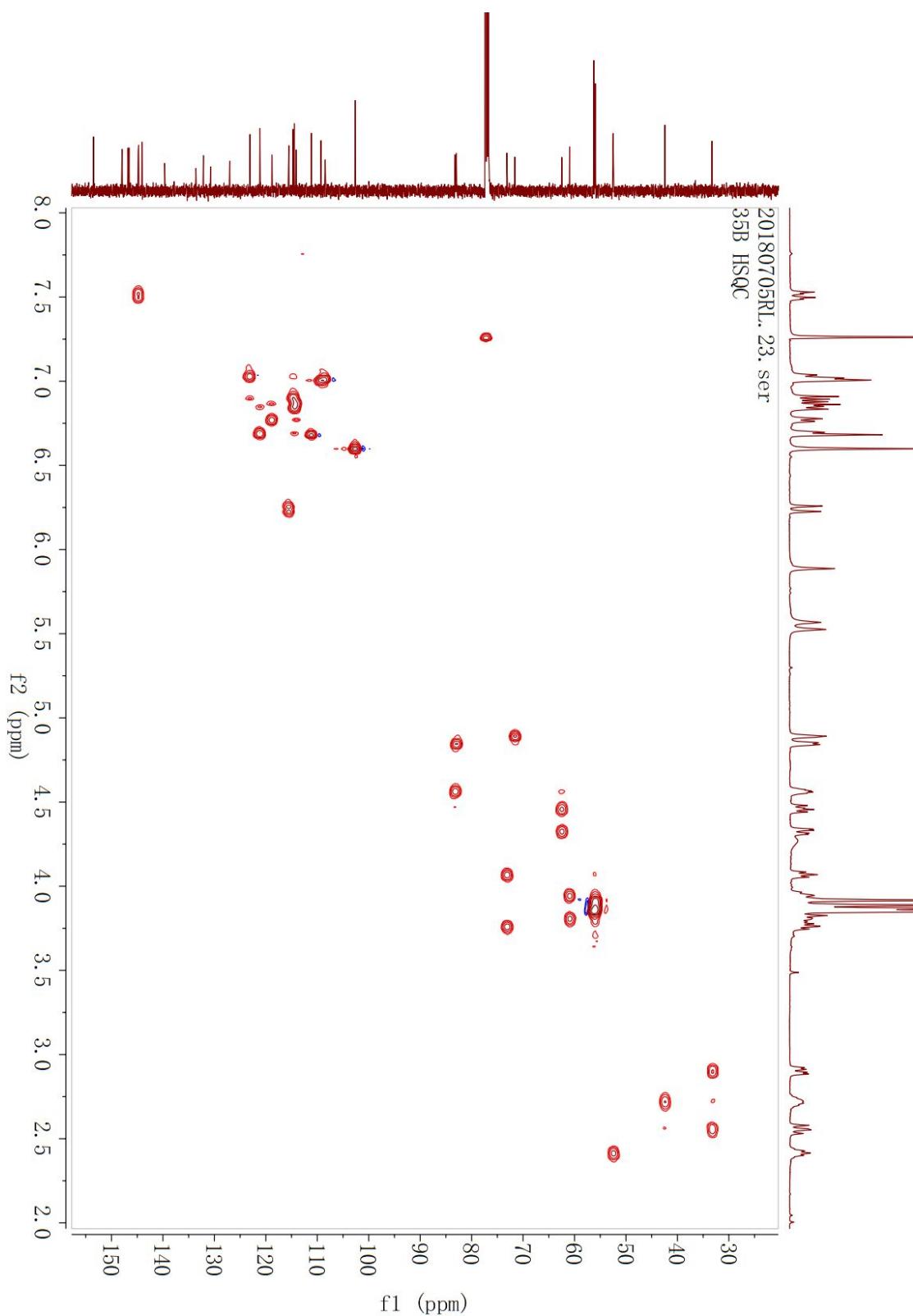
**Figure S42.**  $^{13}\text{C}$  NMR spectrum (150 MHz) of bejolghotin E (**9**) in  $\text{CDCl}_3$



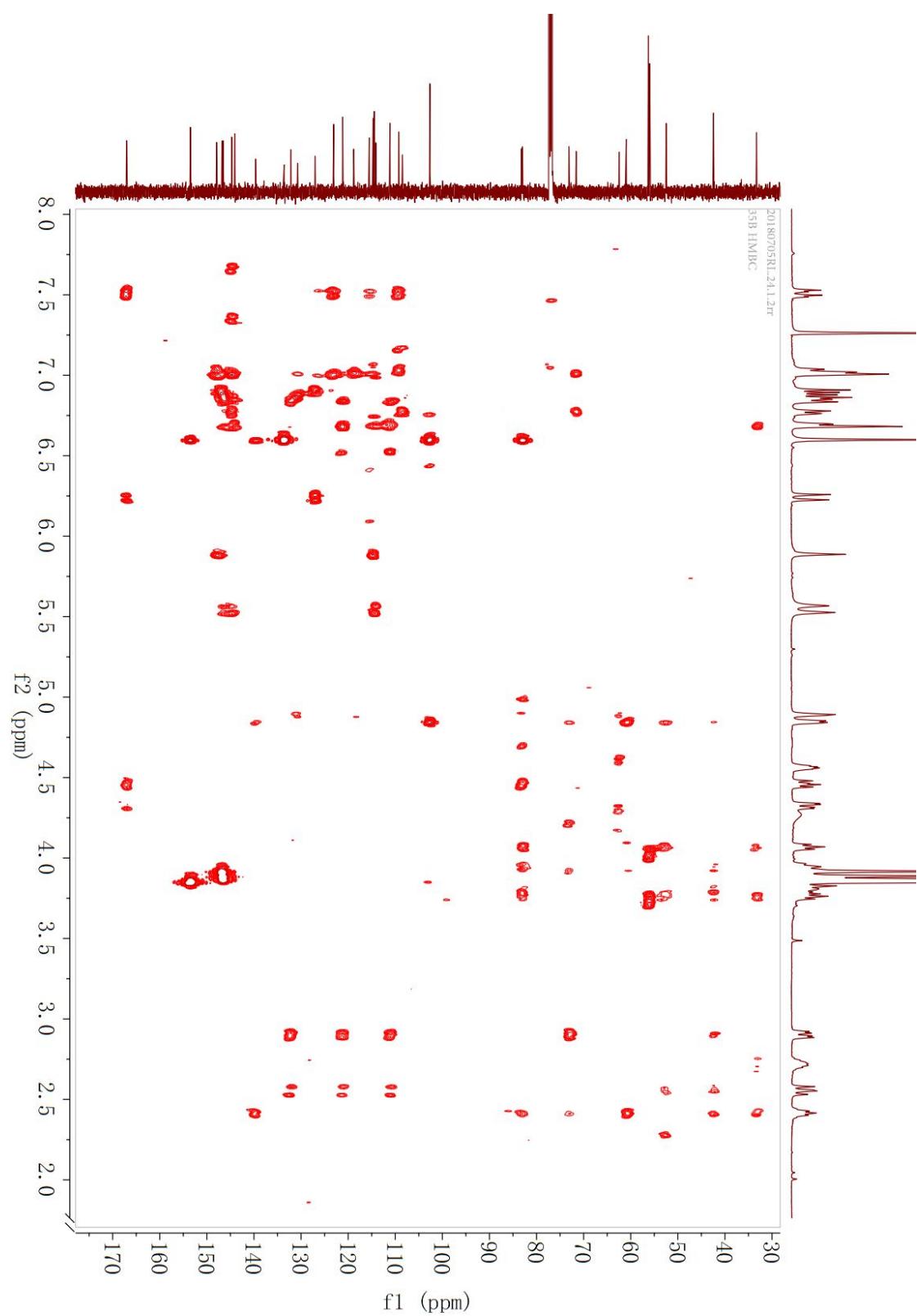
**Figure S43.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum (600 MHz) of bejolghotin E (**9**) in  $\text{CDCl}_3$



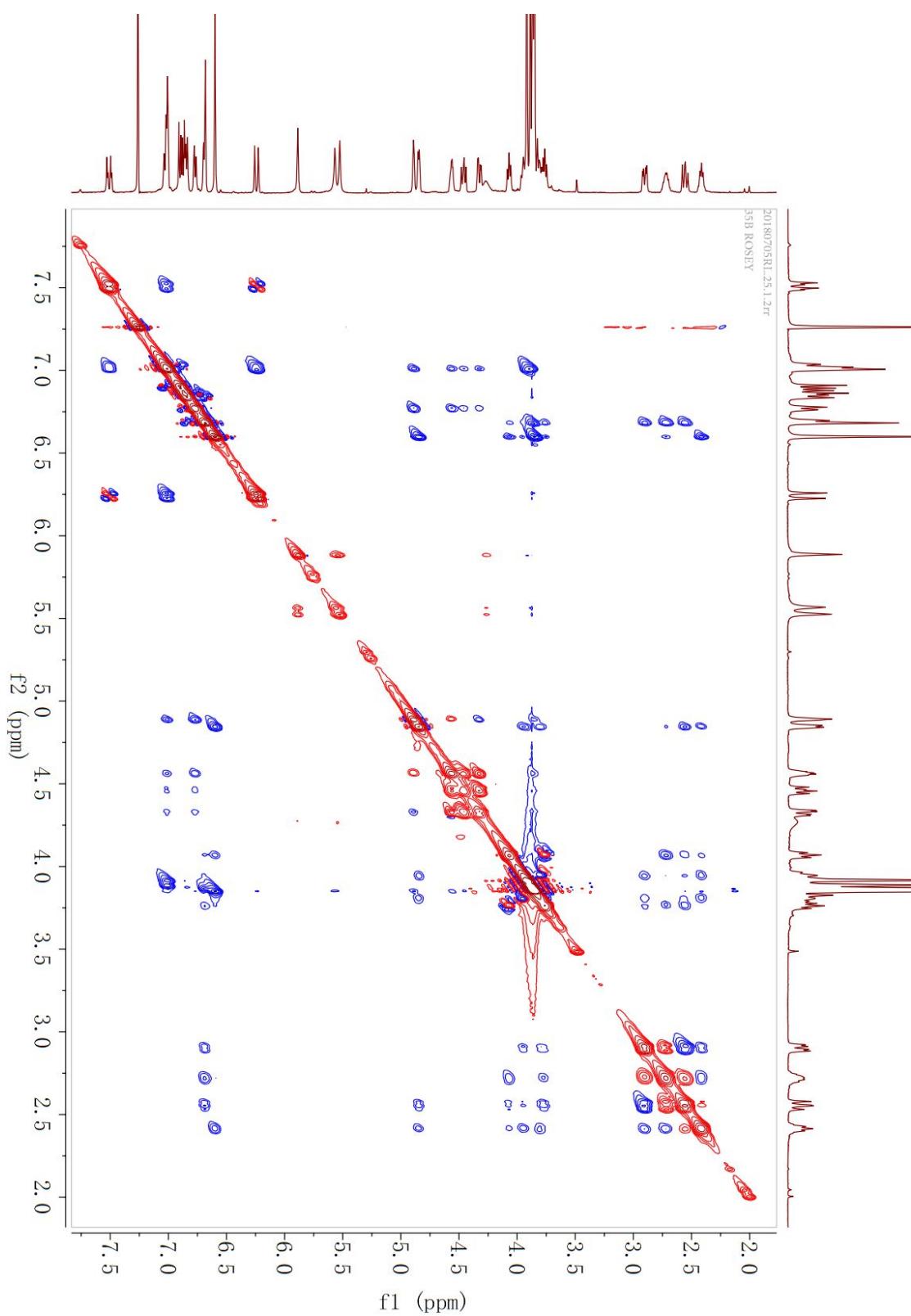
**Figure S44.** HSQC spectrum (600 MHz) of bejolghotin E (**9**) in  $\text{CDCl}_3$



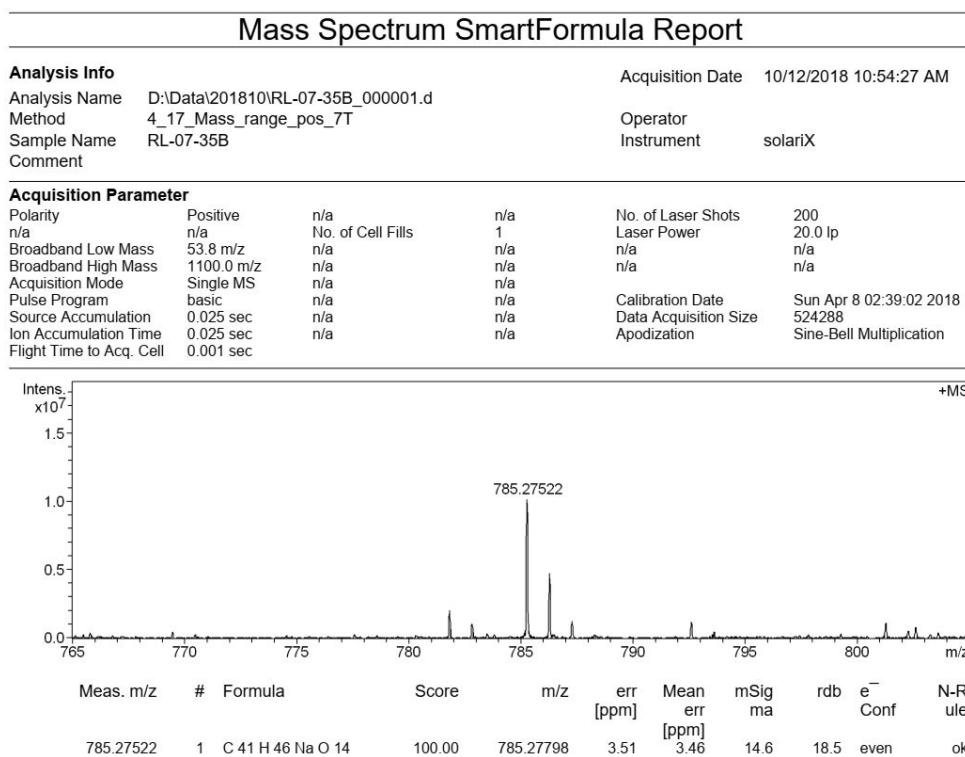
**Figure S45.** HMBC spectrum (600 MHz) of bejolghotin E (**9**) in  $\text{CDCl}_3$



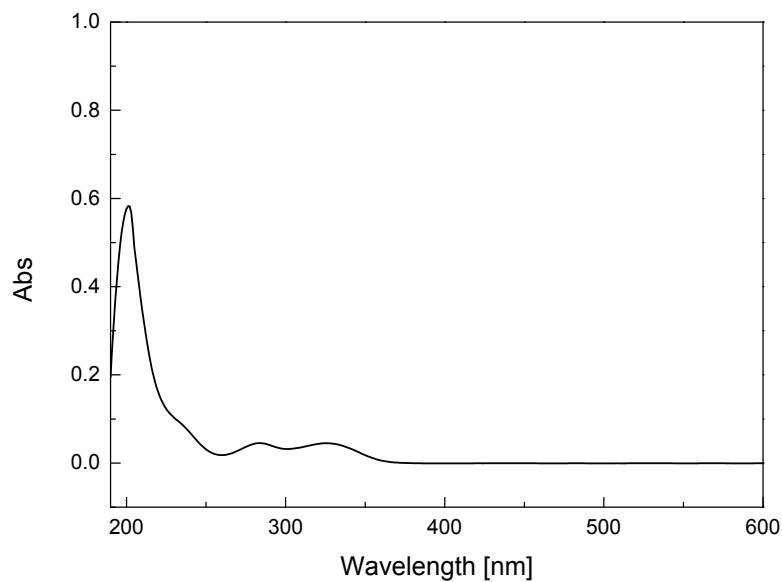
**Figure S46.** ROESY spectrum (600 MHz) of bejolghotin E (**9**) in  $\text{CDCl}_3$



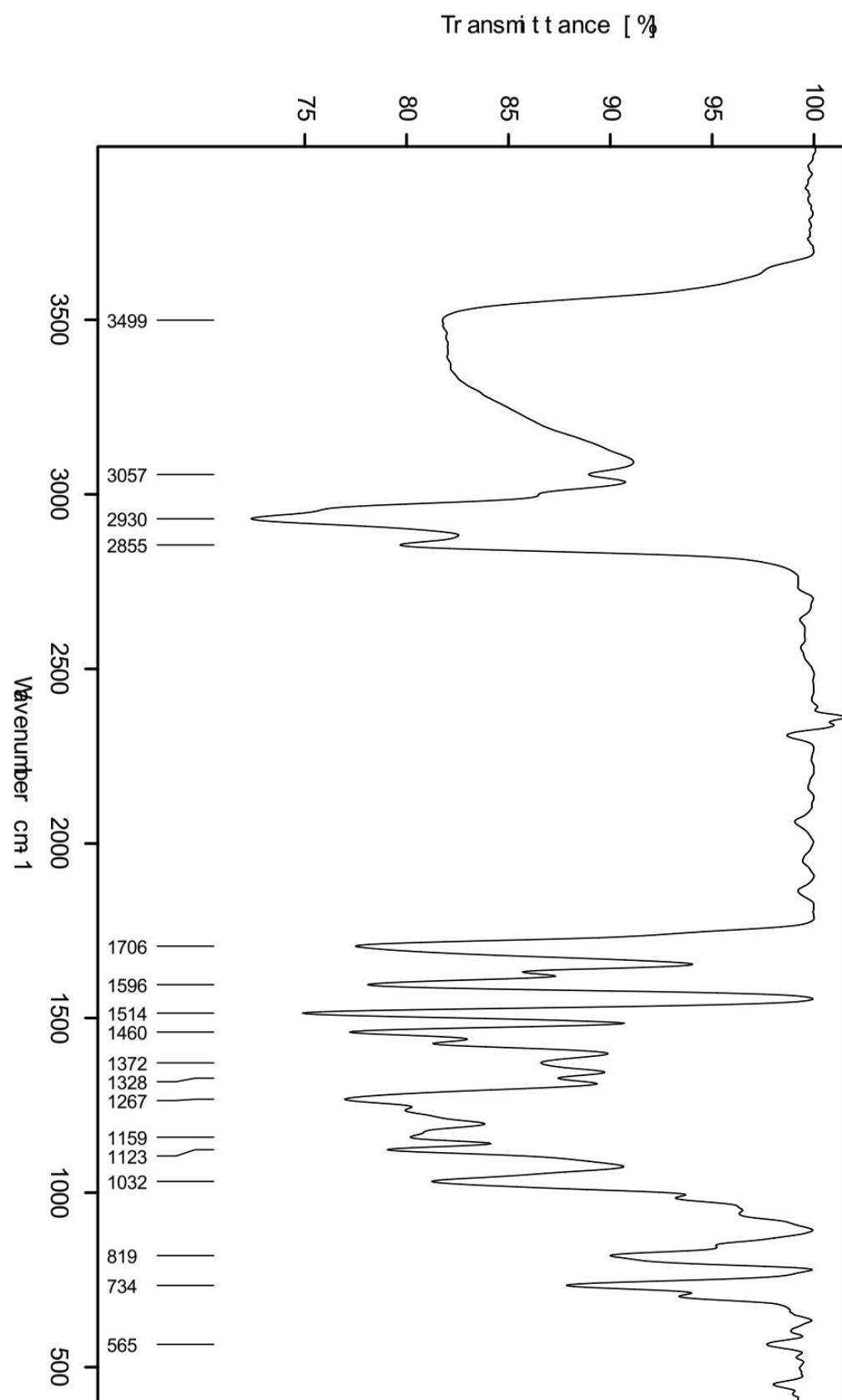
**Figure S47.** HRESIMS spectrum of bejolghotin E (**9**)



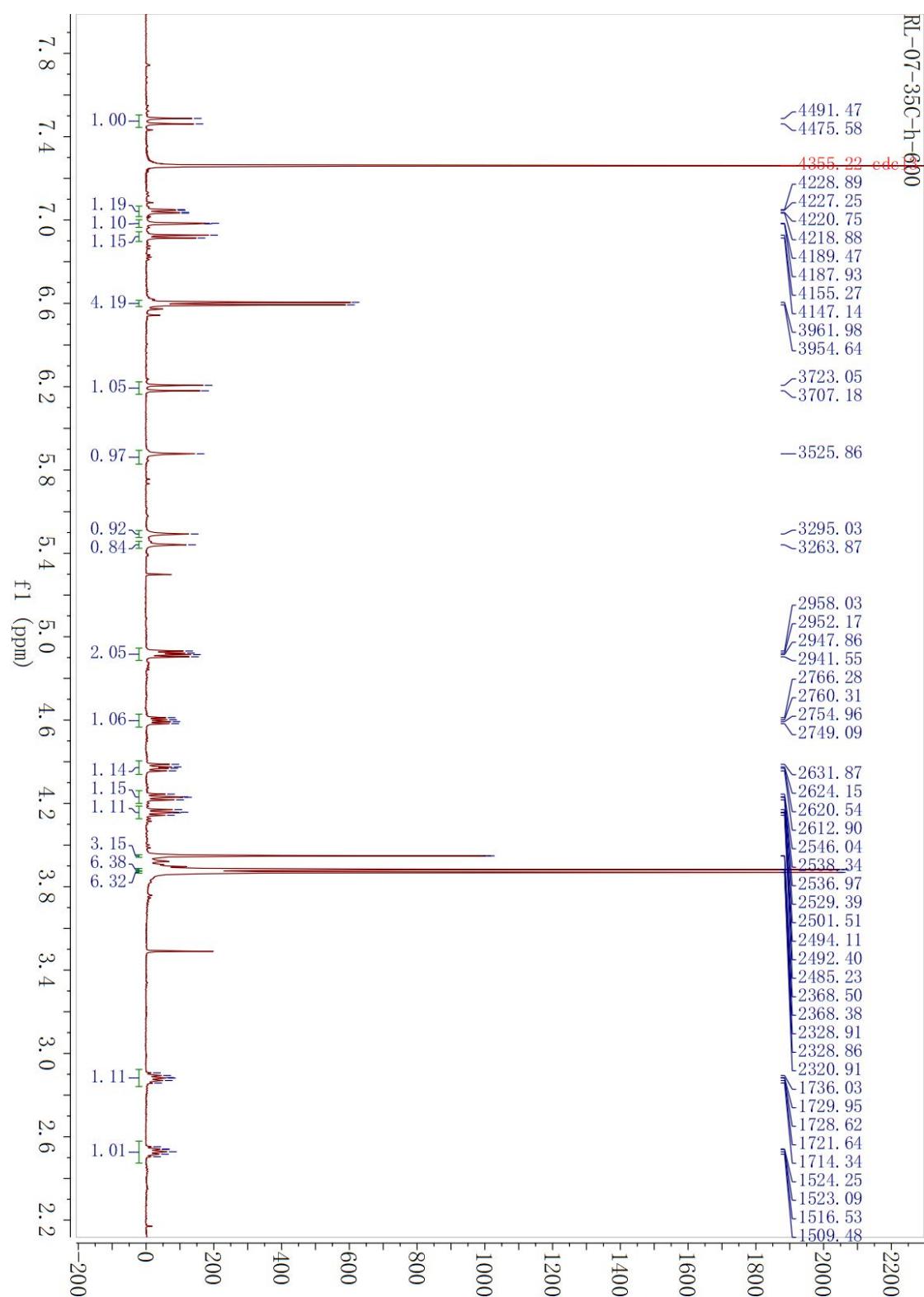
**Figure S48.** UV spectrum of bejolghotin E (**9**)



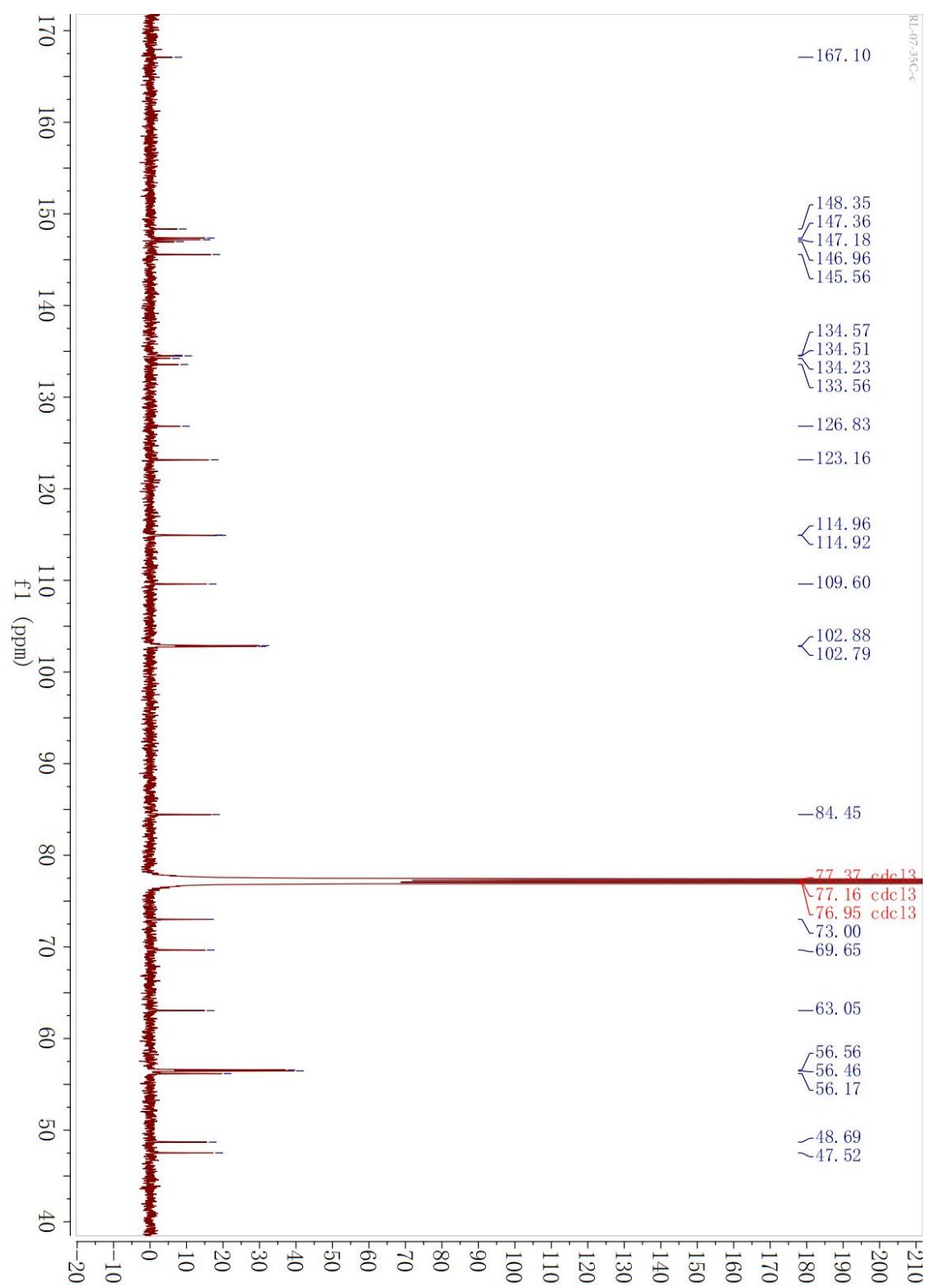
**Figure S49.** IR spectrum (KBr disc) of bejolghotin E (**9**)



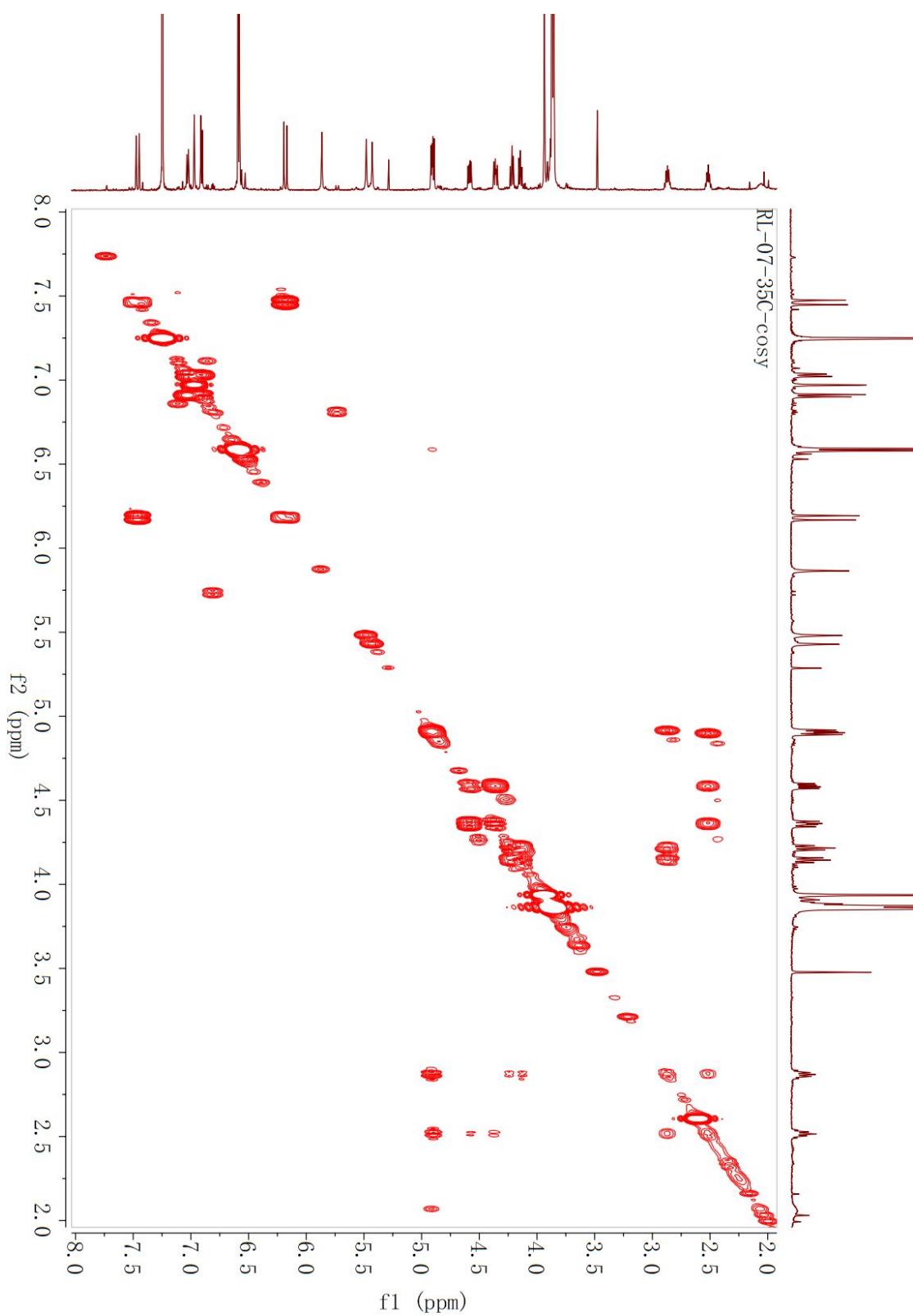
**Figure S50.**  $^1\text{H}$  NMR spectrum (600 MHz) of bejolghotin F (**10**) in  $\text{CDCl}_3$



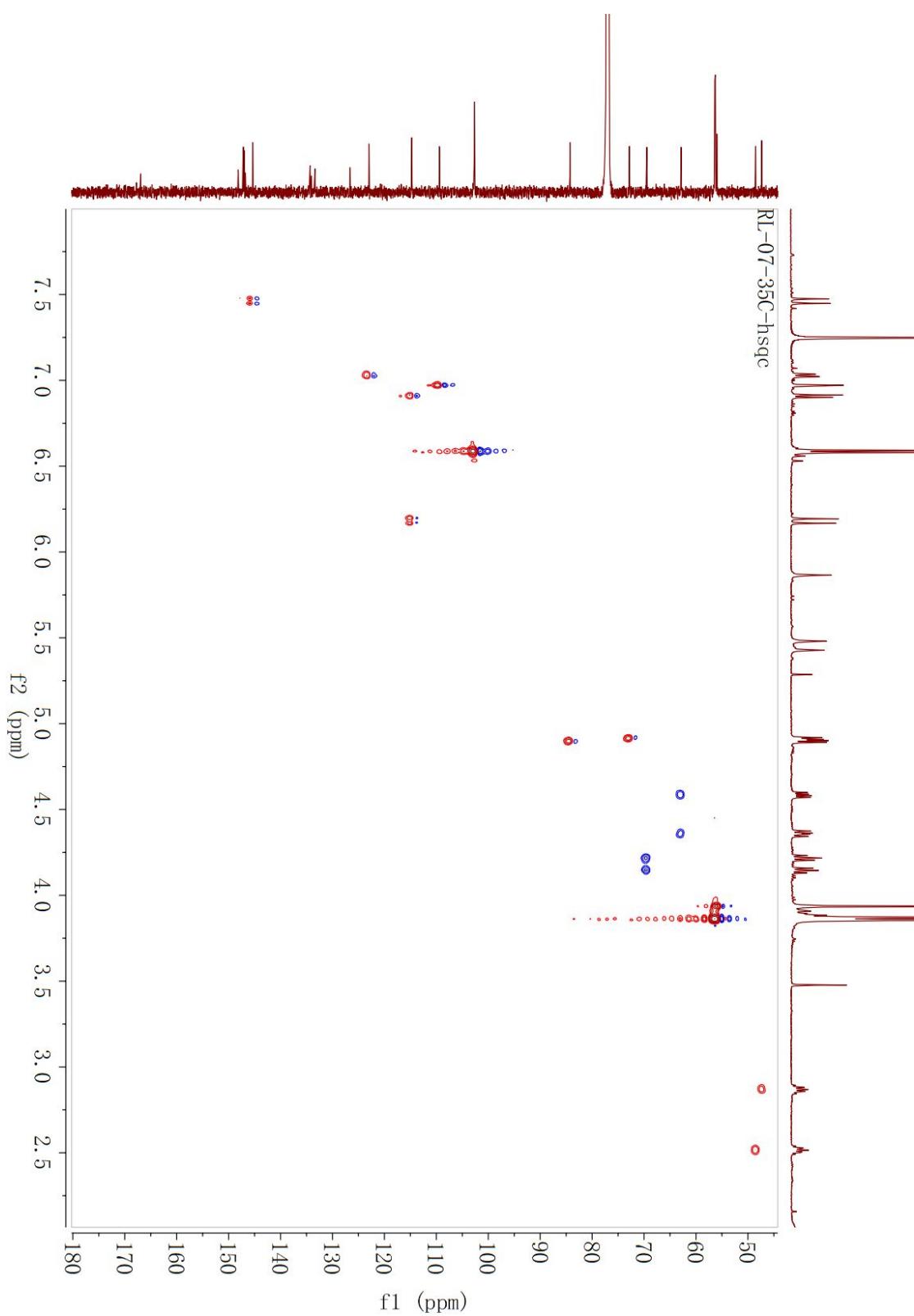
**Figure S51.**  $^{13}\text{C}$  NMR spectrum (150 MHz) of bejolghotin F (**10**) in  $\text{CDCl}_3$



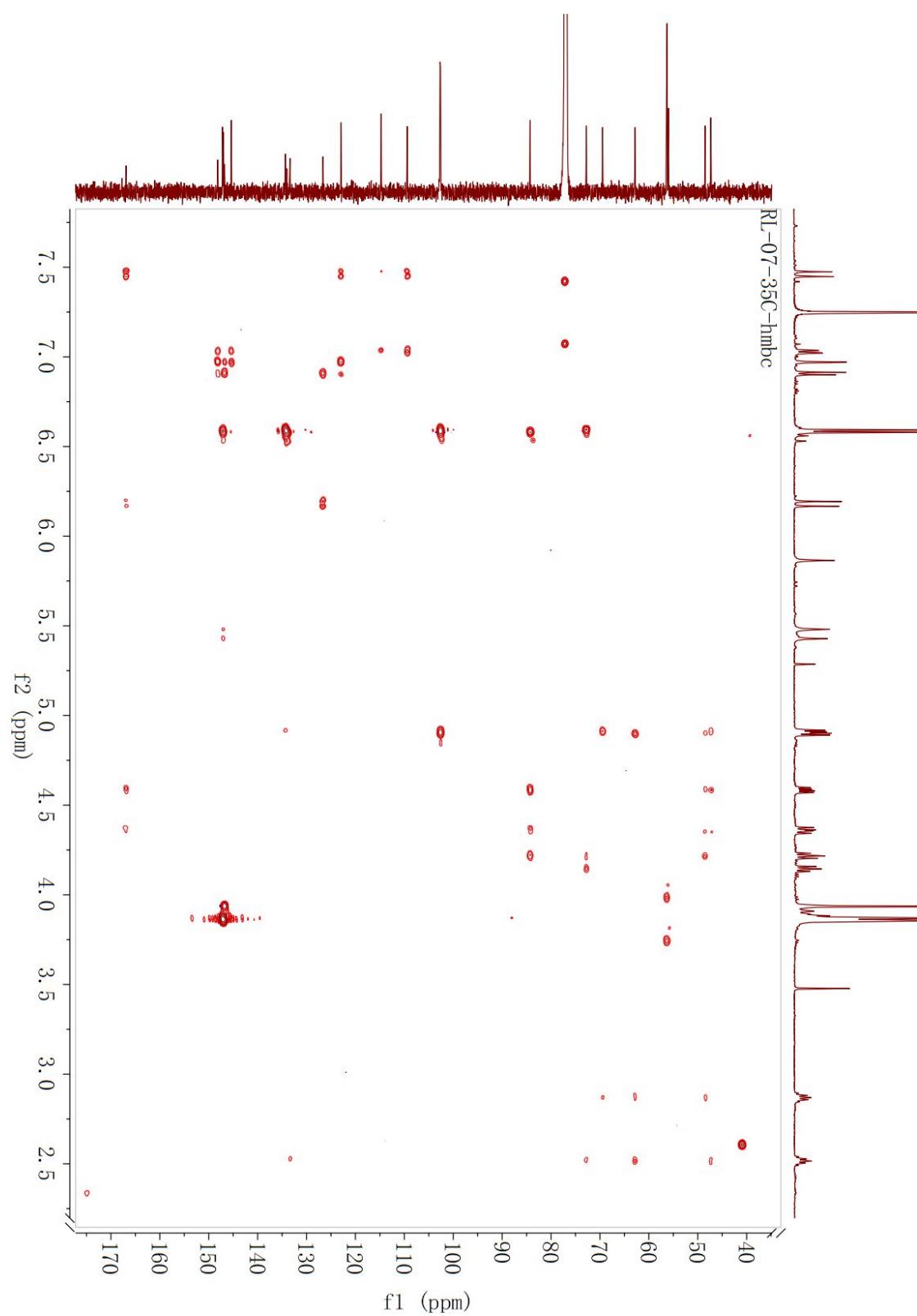
**Figure S52.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum (600 MHz) of bejolghotin F (**10**) in  $\text{CDCl}_3$



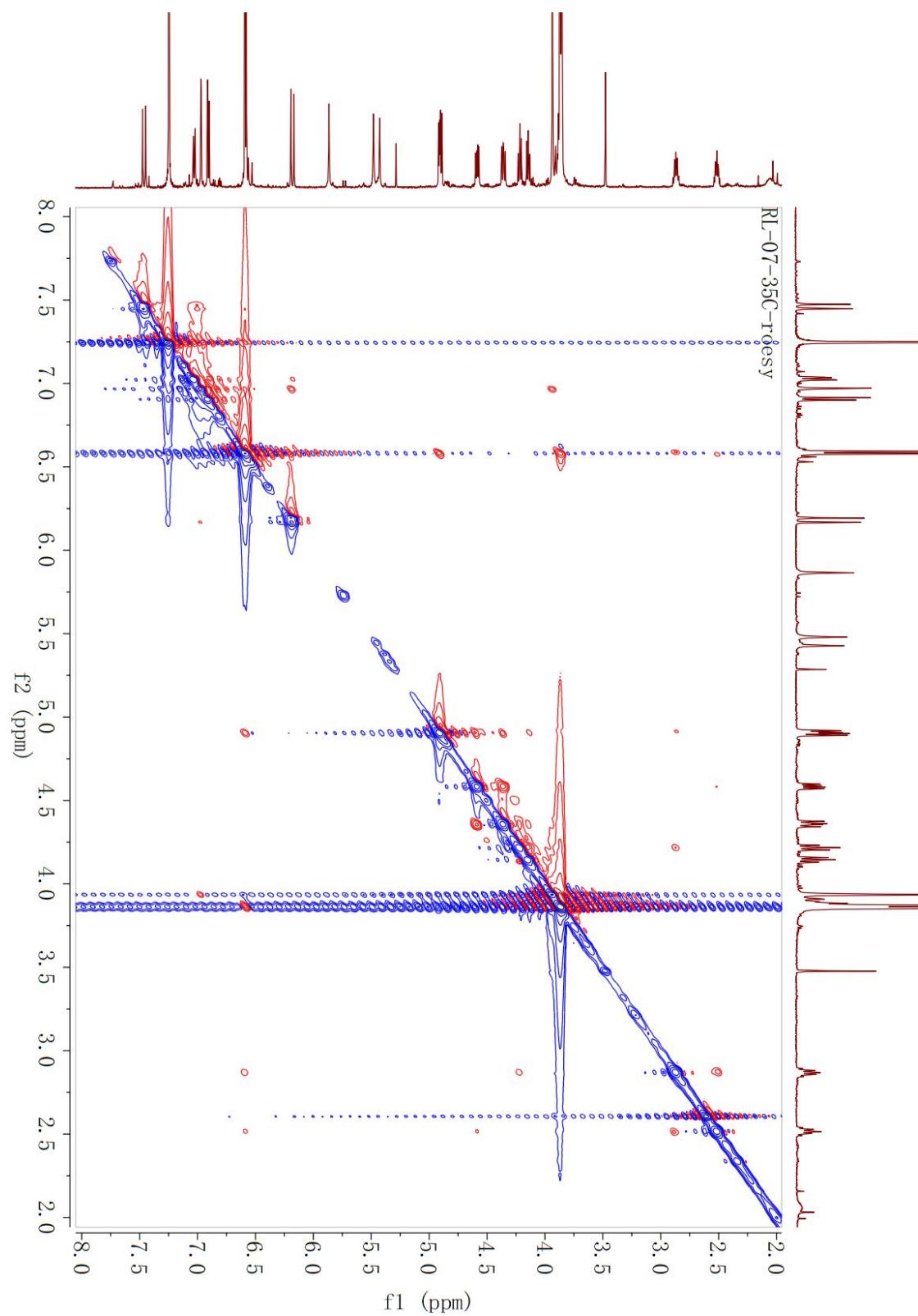
**Figure S53.** HSQC spectrum (600 MHz) of bejolghotin F (**10**) in  $\text{CDCl}_3$



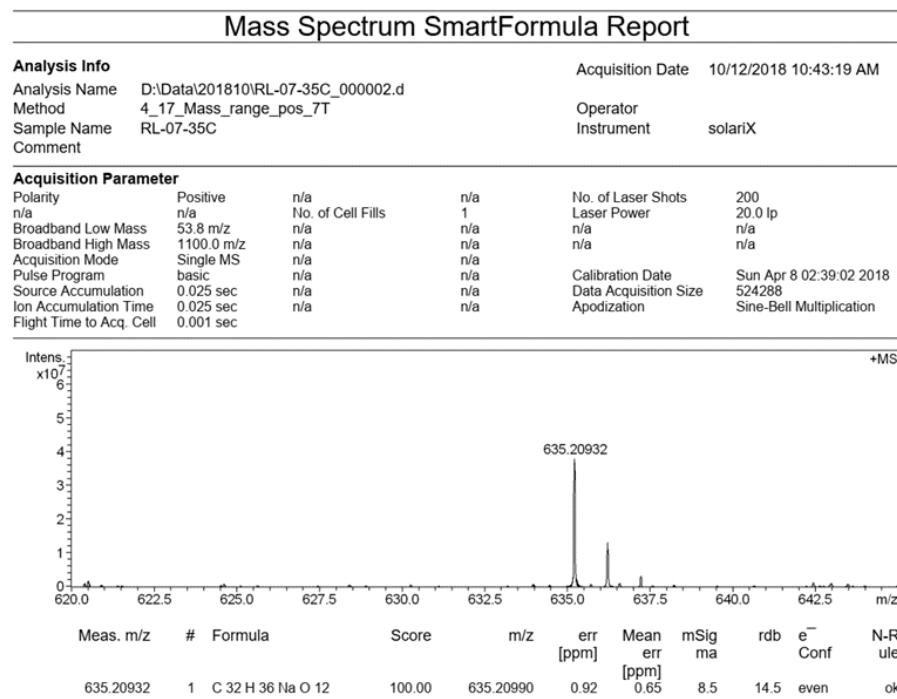
**Figure S54.** HMBC spectrum (600 MHz) of bejolghotin F (**10**) in  $\text{CDCl}_3$



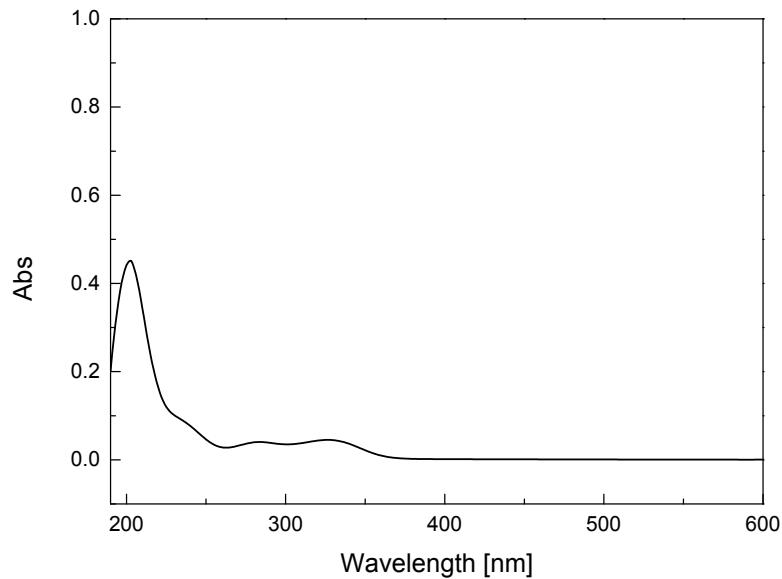
**Figure S55.** ROESY spectrum (600 MHz) of bejolghotin F (**10**) in  $\text{CDCl}_3$



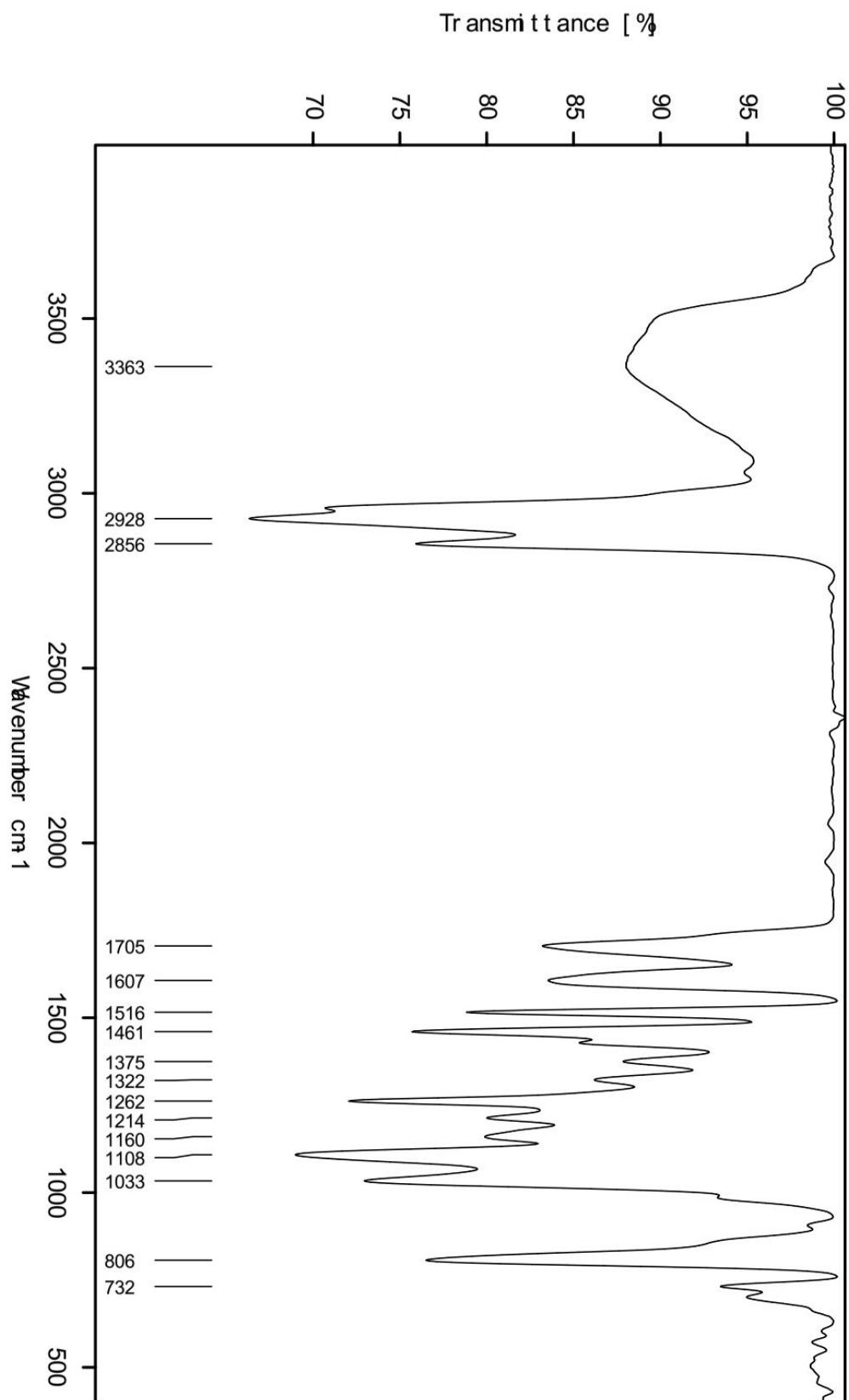
**Figure S56.** HRESIMS spectrum of bejolghotin F (**10**)



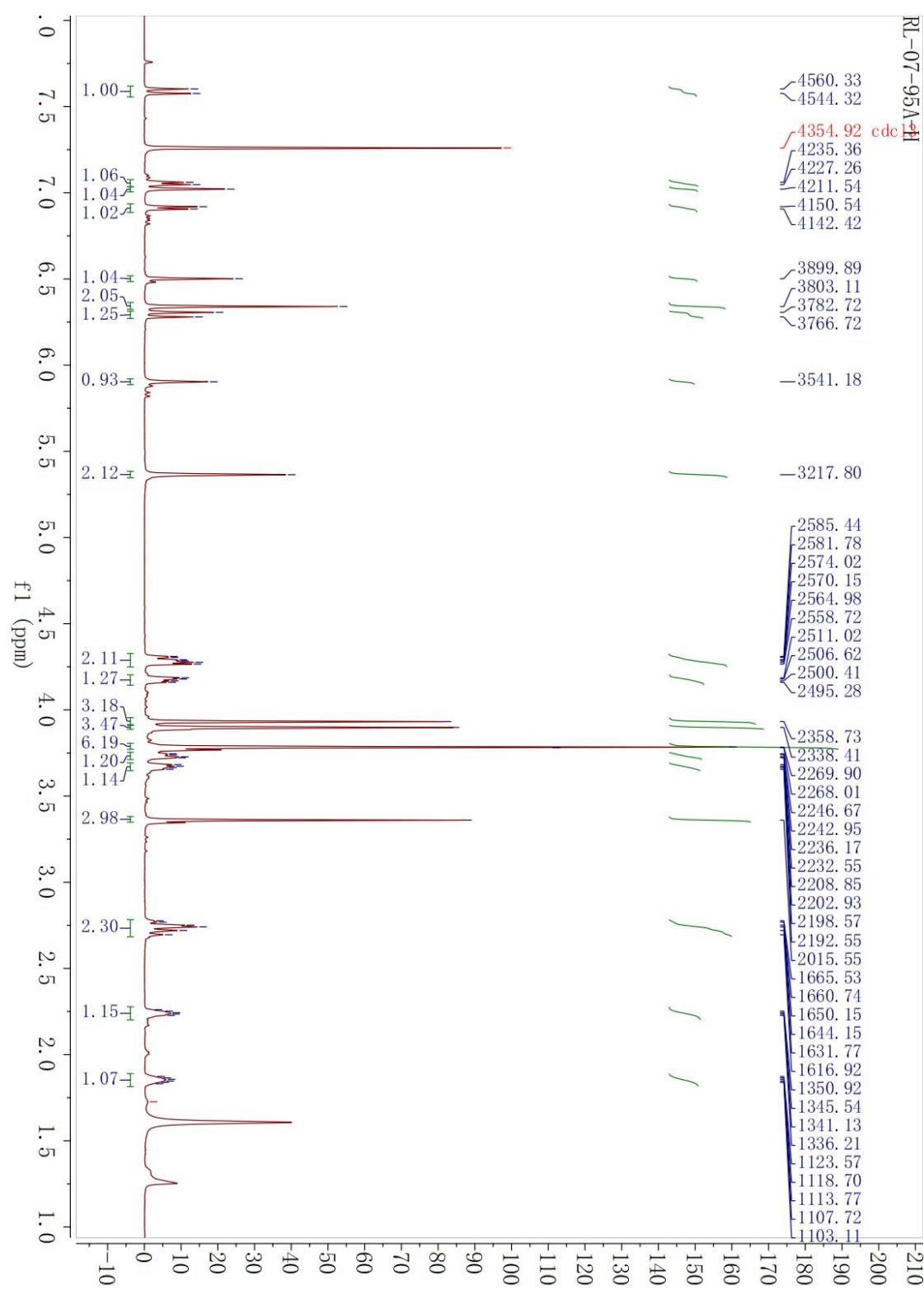
**Figure S57.** UV spectrum of bejolghotin F (**10**)



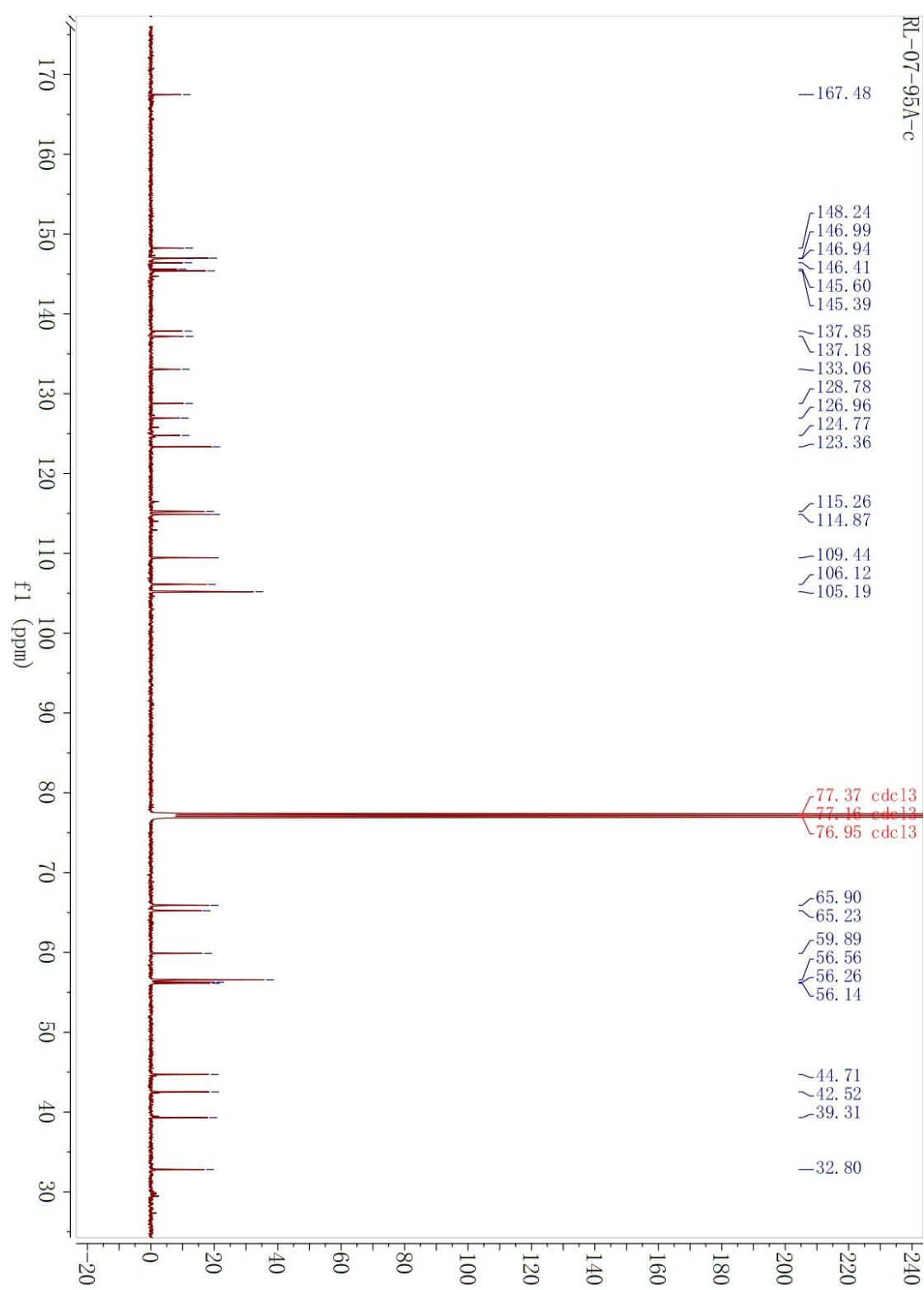
**Figure S58.** IR spectrum (KBr disc) of bejolghotin F (**10**)



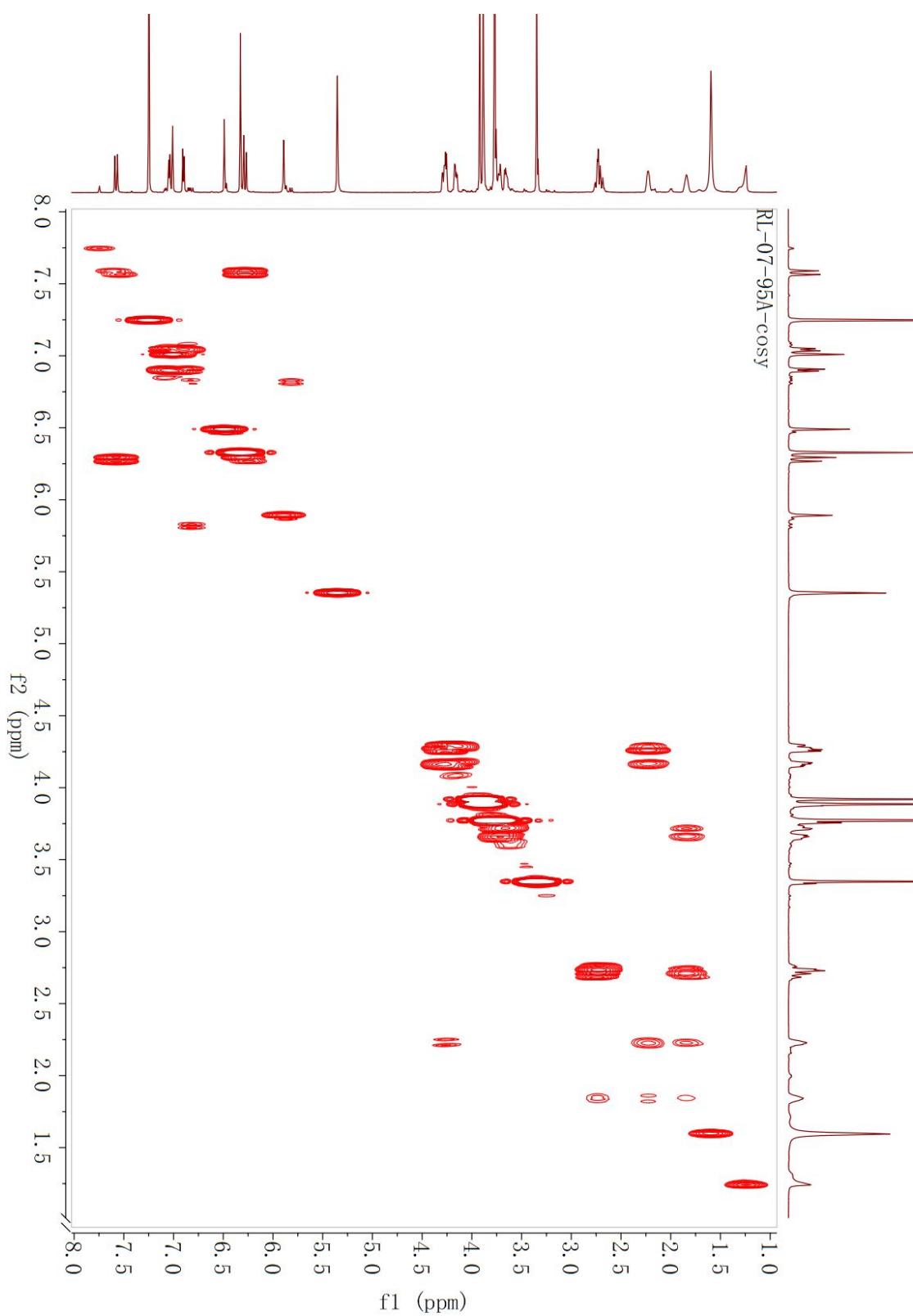
**Figure S59.**  $^1\text{H}$  NMR spectrum (600 MHz) of bejolghotin G (**11**) in  $\text{CDCl}_3$



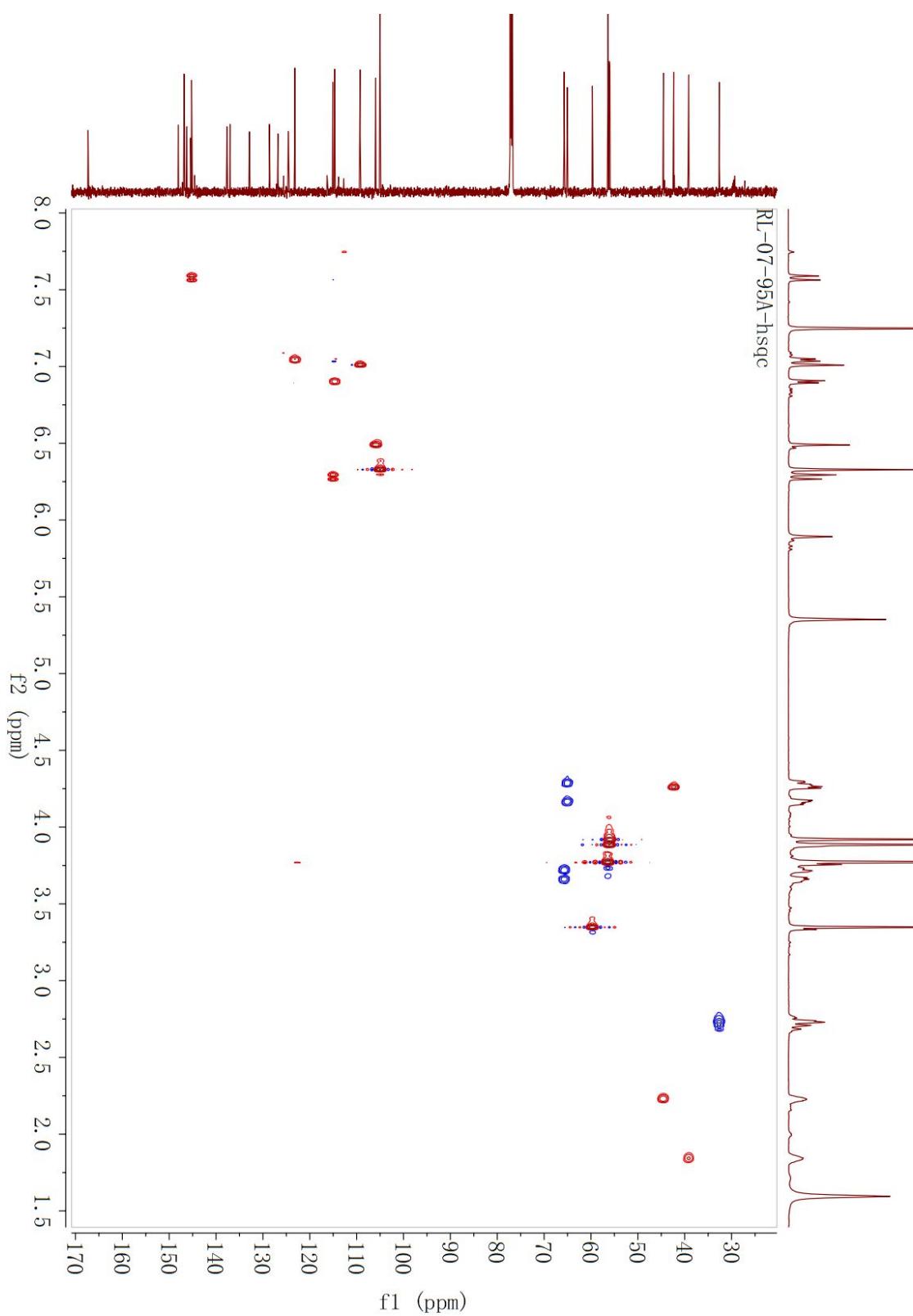
**Figure S60.**  $^{13}\text{C}$  NMR spectrum (150 MHz) of bejolghotin G (**11**) in  $\text{CDCl}_3$



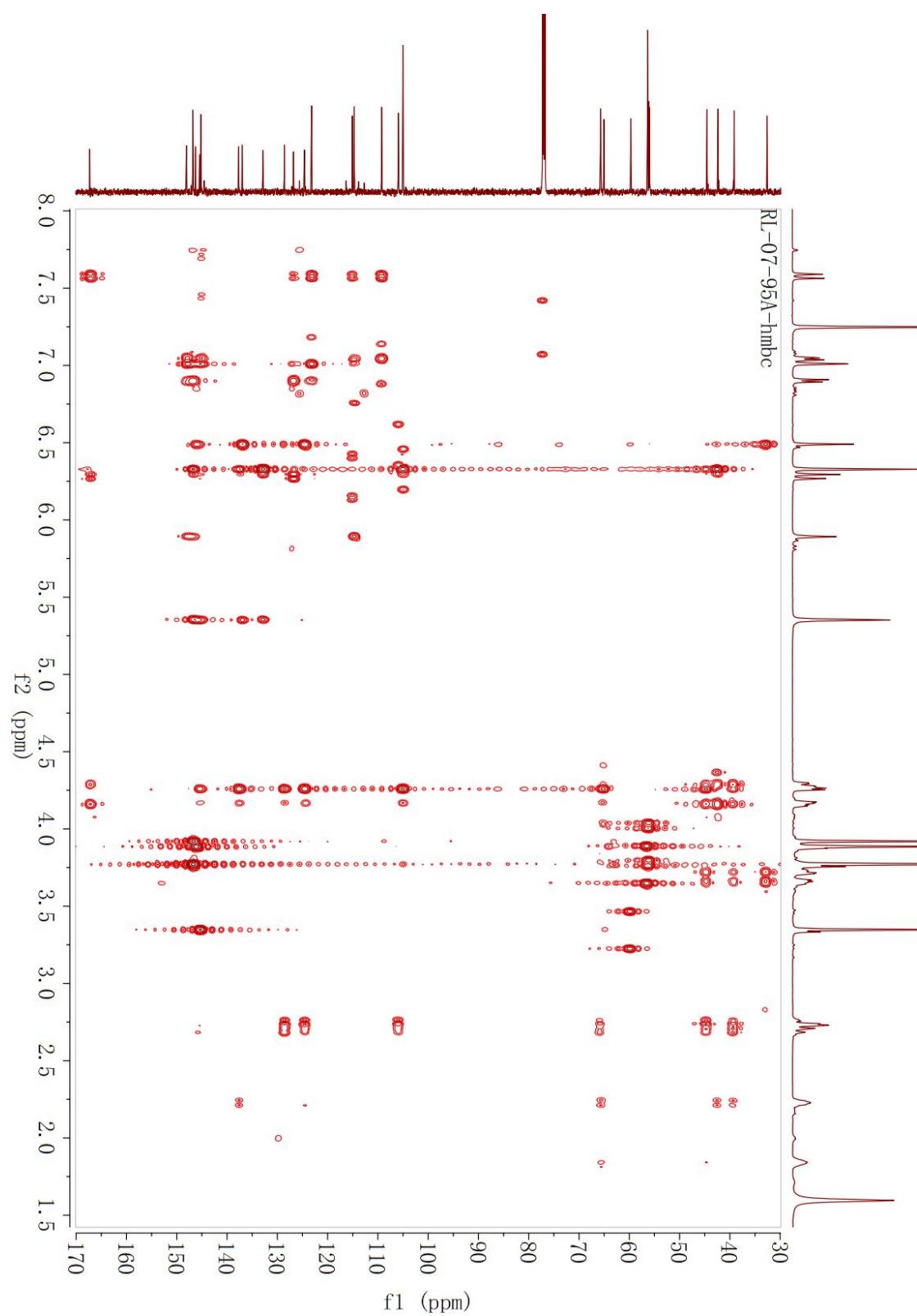
**Figure S61.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum (600 MHz) of bejolghotin G (**11**) in  $\text{CDCl}_3$



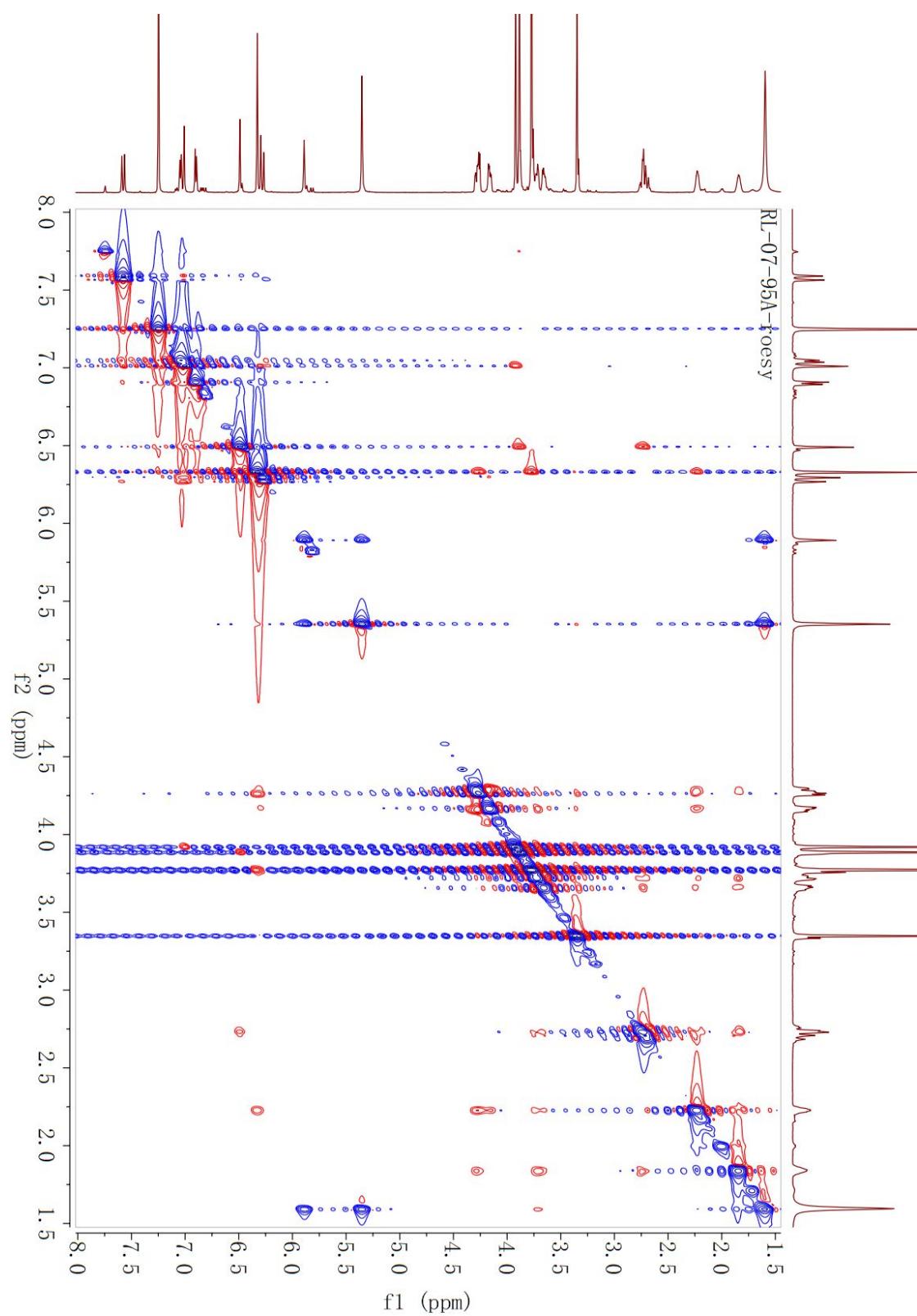
**Figure S62.** HSQC spectrum (600 MHz) of bejolghotin G (**11**) in  $\text{CDCl}_3$



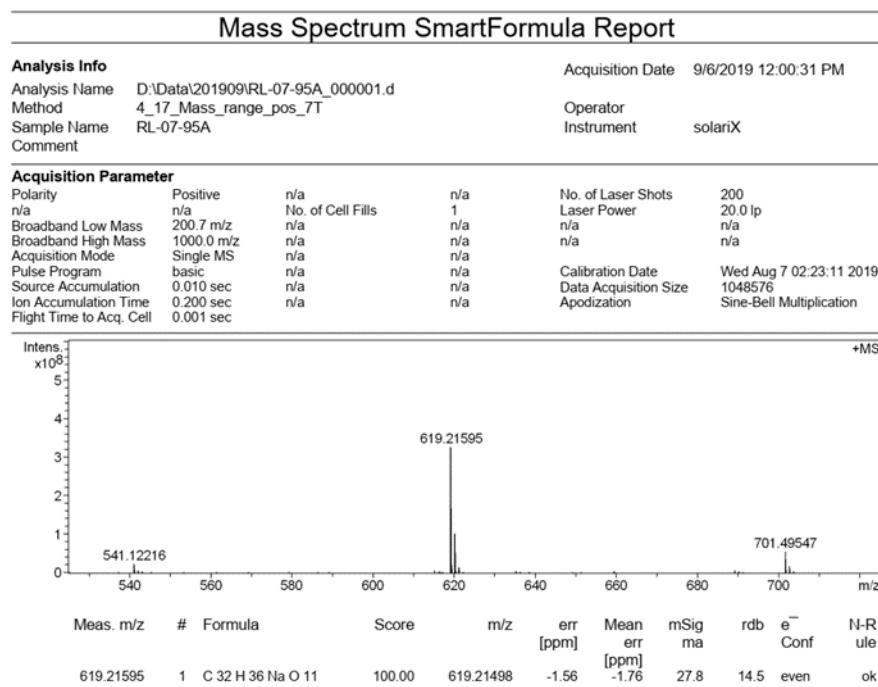
**Figure S63.** HMBC spectrum (600 MHz) of bejolghotin G (**11**) in  $\text{CDCl}_3$



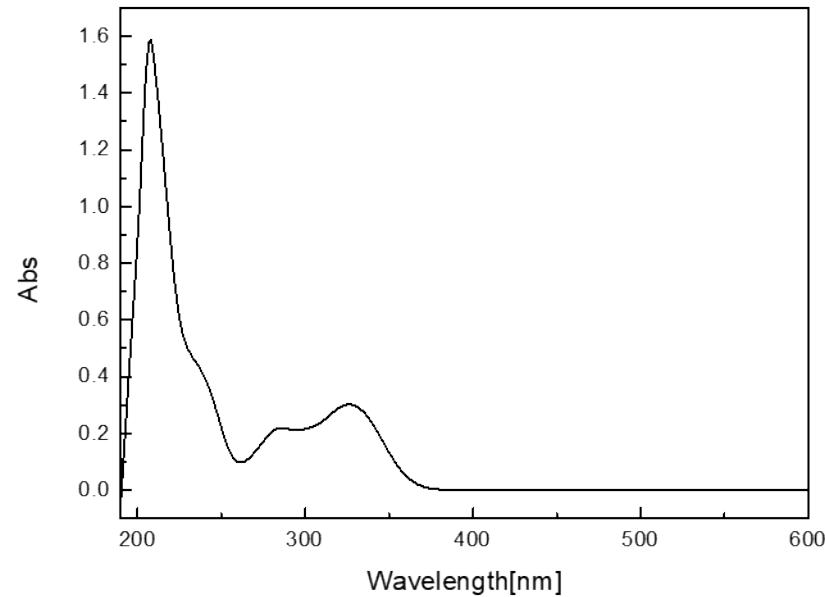
**Figure S64.** ROESY spectrum (600 MHz) of bejolghotin G (**11**) in  $\text{CDCl}_3$



**Figure S65.** HRESIMS spectrum of bejolghotin G (**11**)



**Figure S66.** UV spectrum of bejolghotin G (**11**)



**Figure S67.** IR spectrum (KBr disc) of bejolghotin G (**11**)

