

Supplementary Material

Phenylspirodrimane with Moderate Reversal Effect of Multidrug

Resistance Isolated from The Deep-sea Fungus *Stachybotrys* sp.

3A00409

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Abstract: Two new phenylspirodrimanes, *stachybotrins K and L (1 and 2)* together with eight known analogues (**3-10**) were isolated from deep-sea derived *Stachybotrys* sp. MCCC 3A00409. Their structures were determined by extensive NMR data and mass spectroscopic analysis. Absolute configurations of new compounds were determined by comparison of their circular dichroism (CD) spectra with other reported compounds. **The possible reversal effects of all compounds were assayed the in the resistant cancer cell lines.** Stachybotrysin B (**8**) can reverse multidrug resistance (MDR) in ABCB1 over expression cells (KBv200, HeLa/VCR) at the non-cytotoxic concentration. Doxorubicin accumulation assay and molecular-docking analysis reveal that the mechanism of its reversal MDR effect may be related to the increase of the intracellular concentration of substrate anticancer drugs.

Keywords: deep-sea fungus; *Stachybotrys*; phenylspirodrimanes; multidrug resistance (MDR); reversal MDR effects

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Figure S1 Key ^1H - ^1H COSY, HMBC and NOESY correlations of **2**

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Figure S4 ^1H NMR Spectrum (600 MHz) of stachybotrin K (**1**) in $\text{DMSO-}d_6$

Figure S5. ^{13}C NMR Spectrum (150 MHz) of stachybotrin K (**1**) in $\text{DMSO-}d_6$

Figure S6 DEPT 90 Spectrum (100 MHz) of stachybotrin K (**1**) in $\text{DMSO-}d_6$

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Figure S21 HMBC Spectrum of stachybotrin L (**2**) in $\text{DMSO-}d_6$

Figure S22 ROSEY Spectrum of stachybotrin L (**2**) in $\text{DMSO-}d_6$

Figure S23 HRESIMS Spectrum of stachybotrin L (**2**)

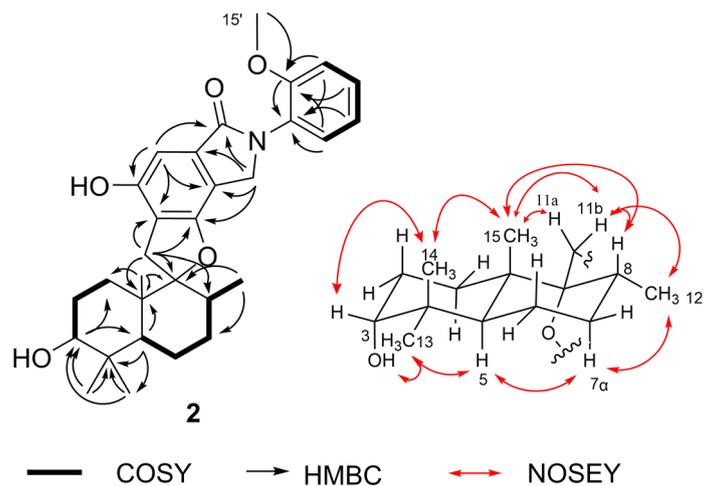


Figure S1 Key ^1H - ^1H COSY, HMBC and NOESY correlations of compound **2**.

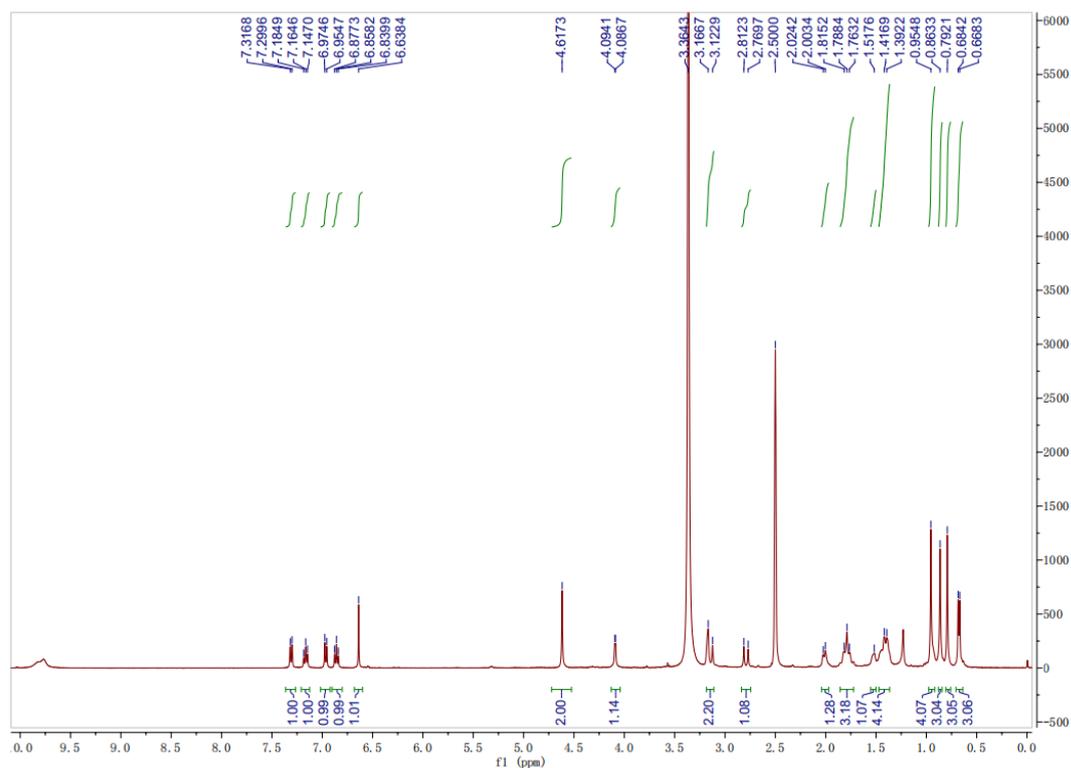


Figure S2 ^1H NMR Spectrum (400 MHz) of stachybotrin K (**1**) in $\text{DMSO-}d_6$

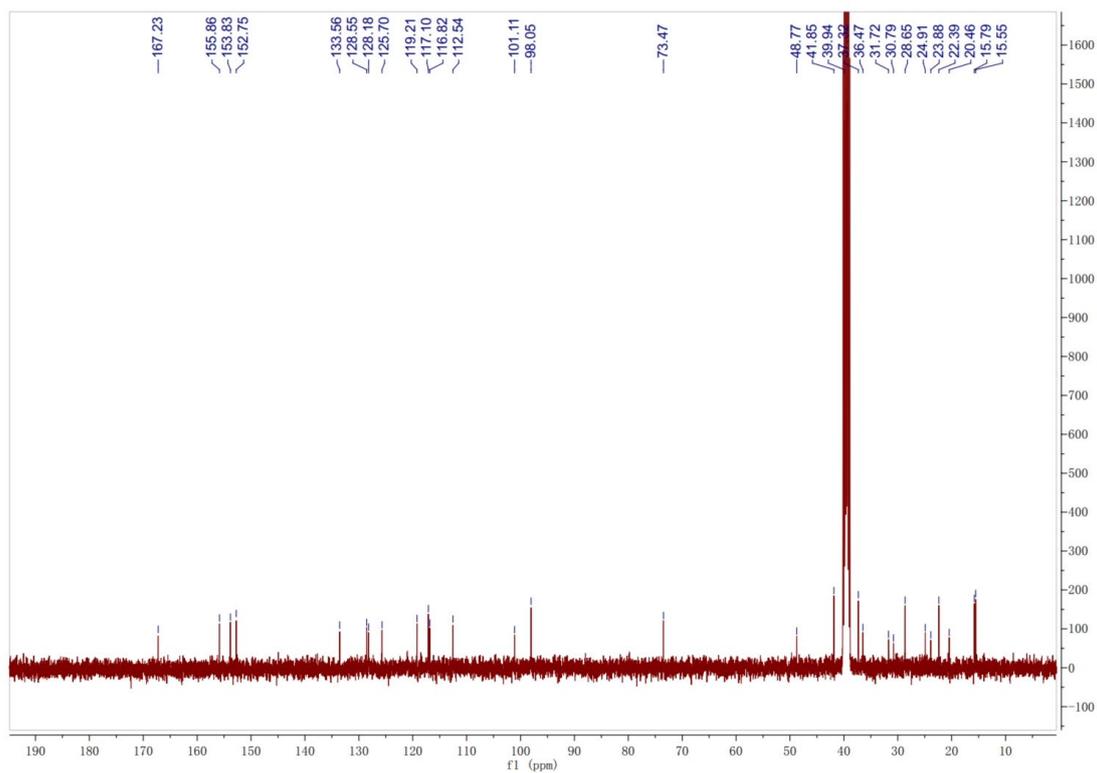


Figure S3 ^{13}C NMR Spectrum (100 MHz) of stachybotrin K (**1**) in $\text{DMSO-}d_6$

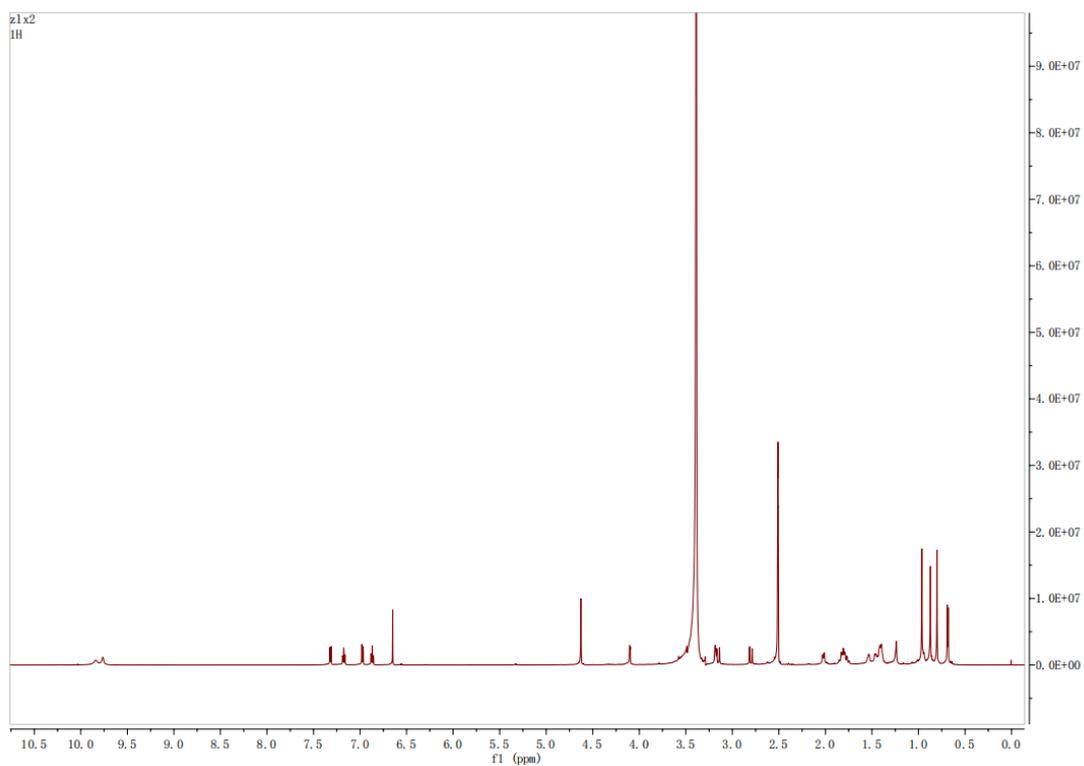


Figure S4 ^1H NMR Spectrum (600 MHz) of stachybotrin K (**1**) in $\text{DMSO-}d_6$

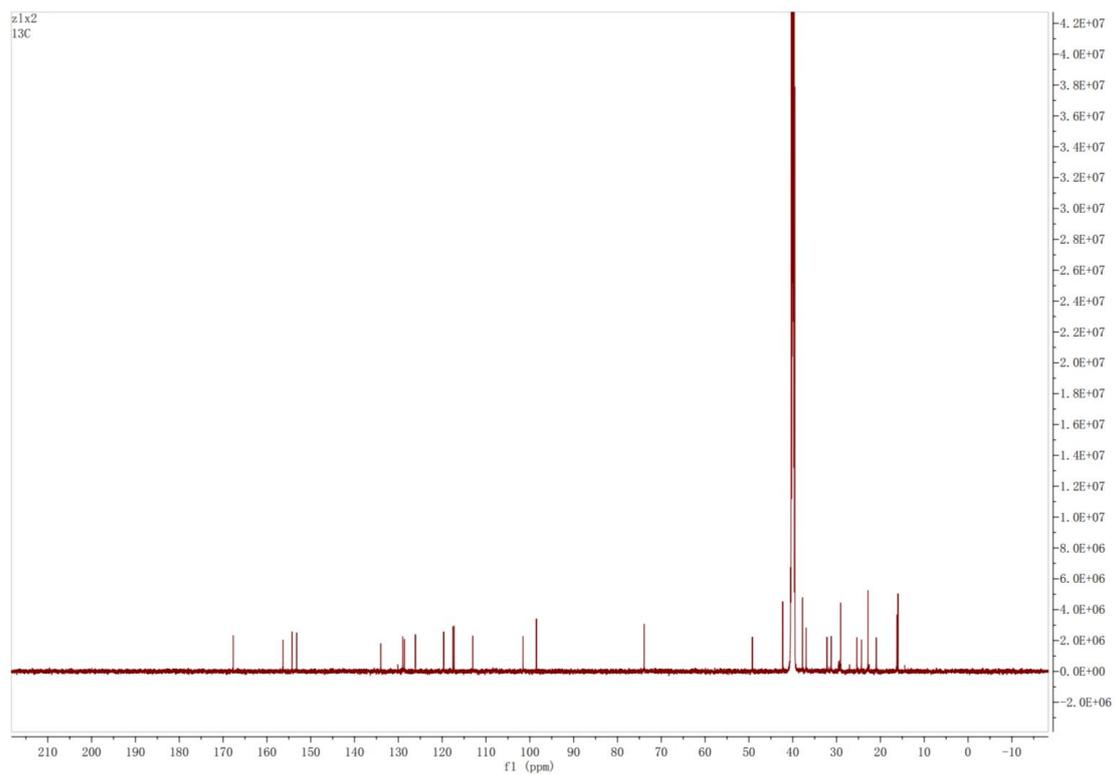


Figure S5 ^{13}C NMR Spectrum (150 MHz) of stachybotrin K (1) in $\text{DMSO-}d_6$

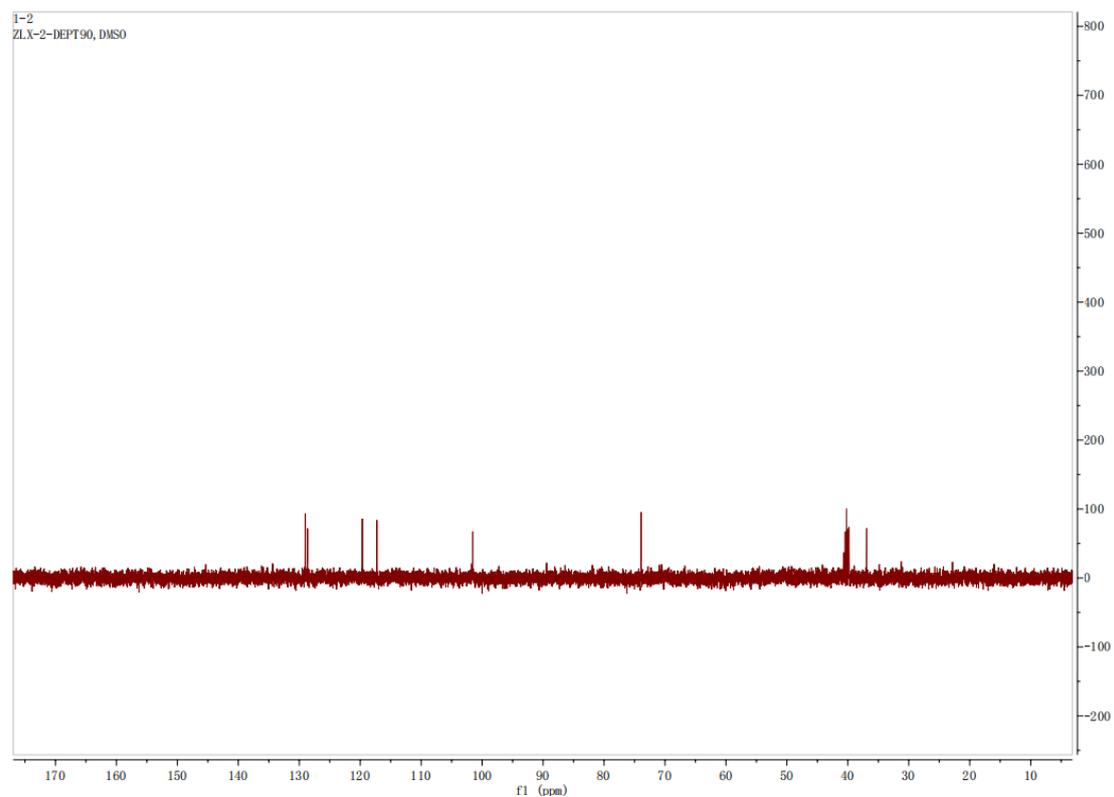


Figure S6 DEPT 90 Spectrum (100 MHz) of stachybotrin K (1) in $\text{DMSO-}d_6$

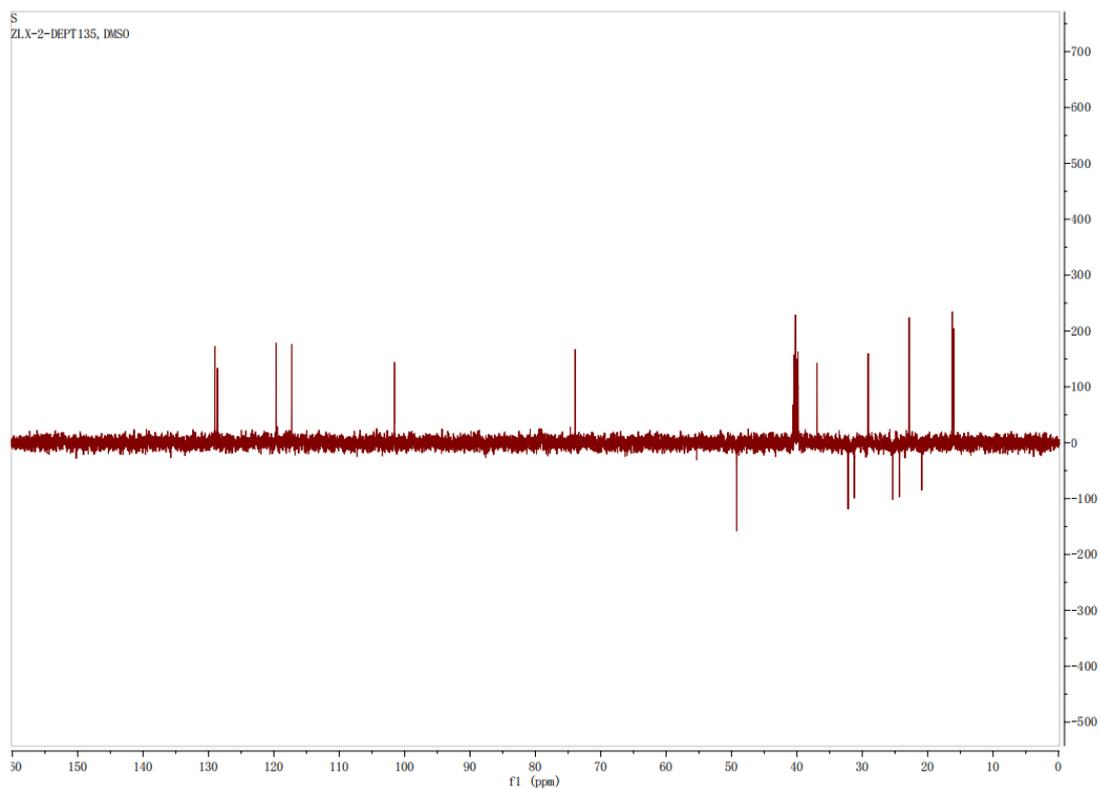


Figure S7 DEPT 135 Spectrum (100 MHz) of stachybotrin K (**1**) in DMSO-*d*₆

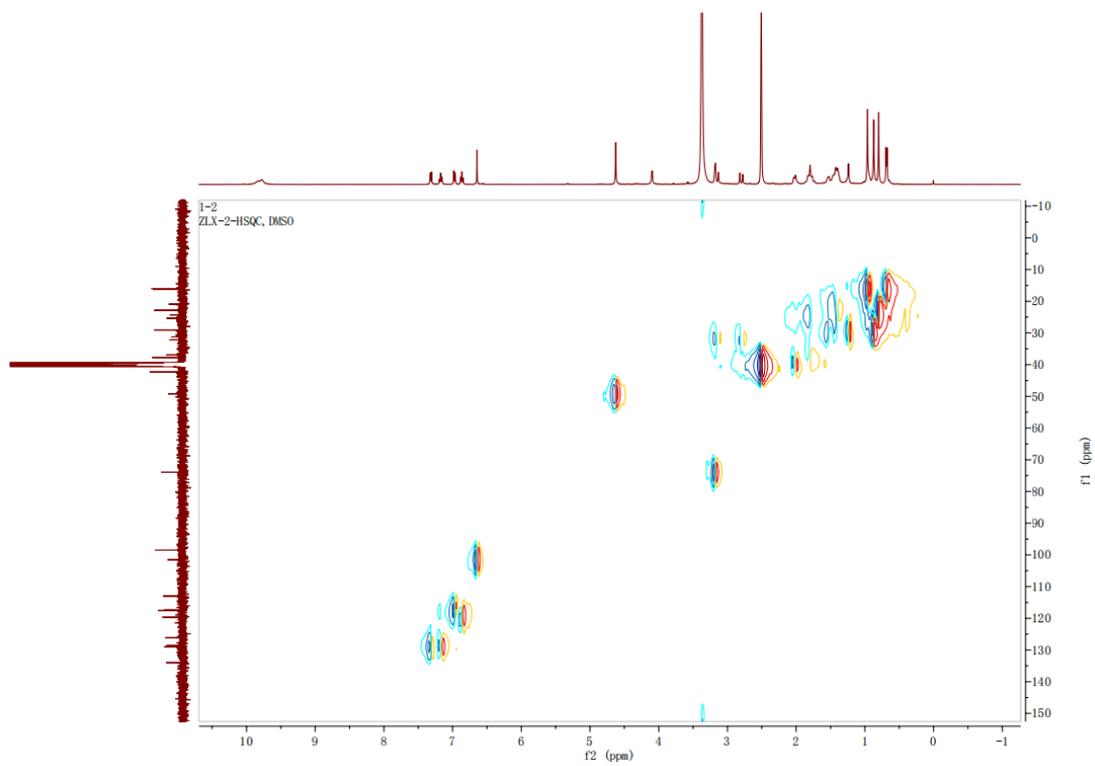


Figure S8 HMQC Spectrum of stachybotrin K (**1**) in DMSO-*d*₆

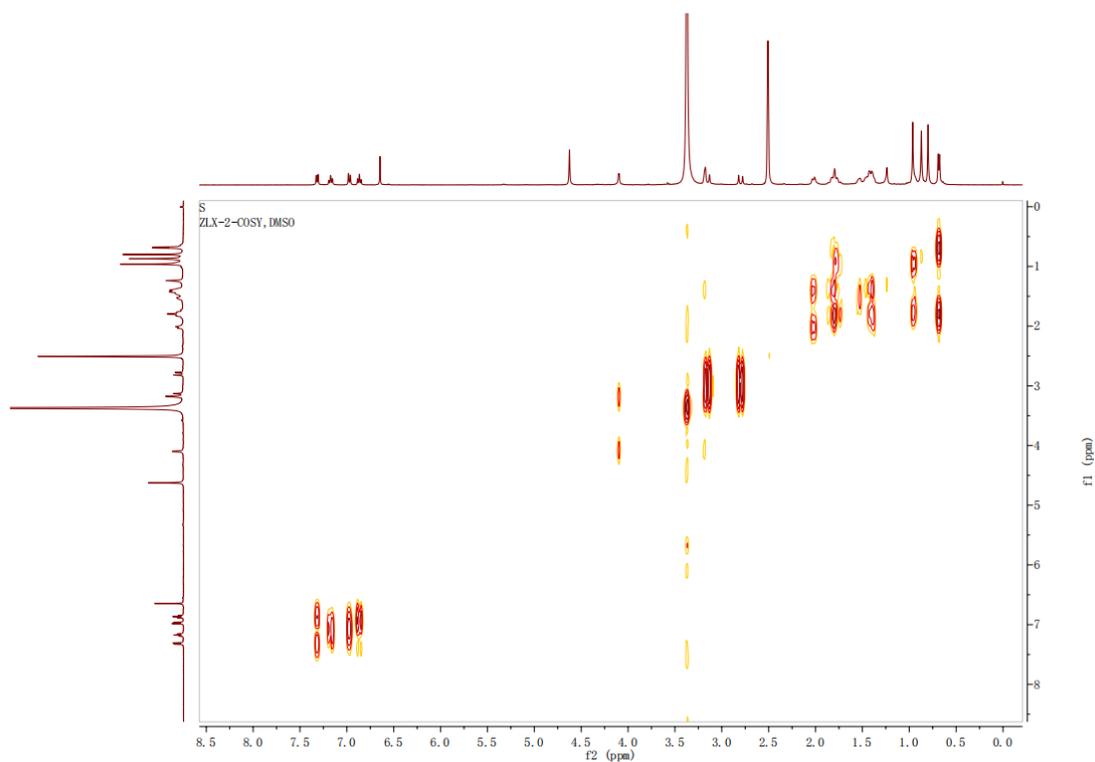


Figure S9 ^1H - ^1H COSY Spectrum of stachybotrin K (1) in $\text{DMSO-}d_6$

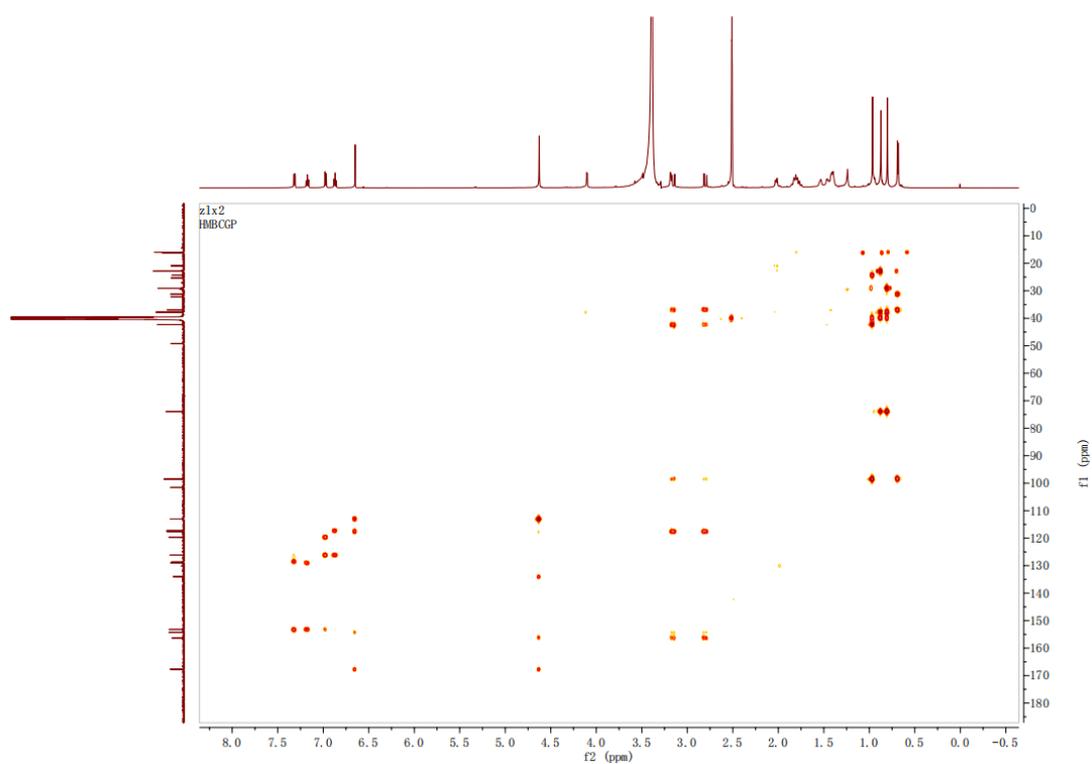


Figure S10 HMBC Spectrum of stachybotrin K (1) in $\text{DMSO-}d_6$

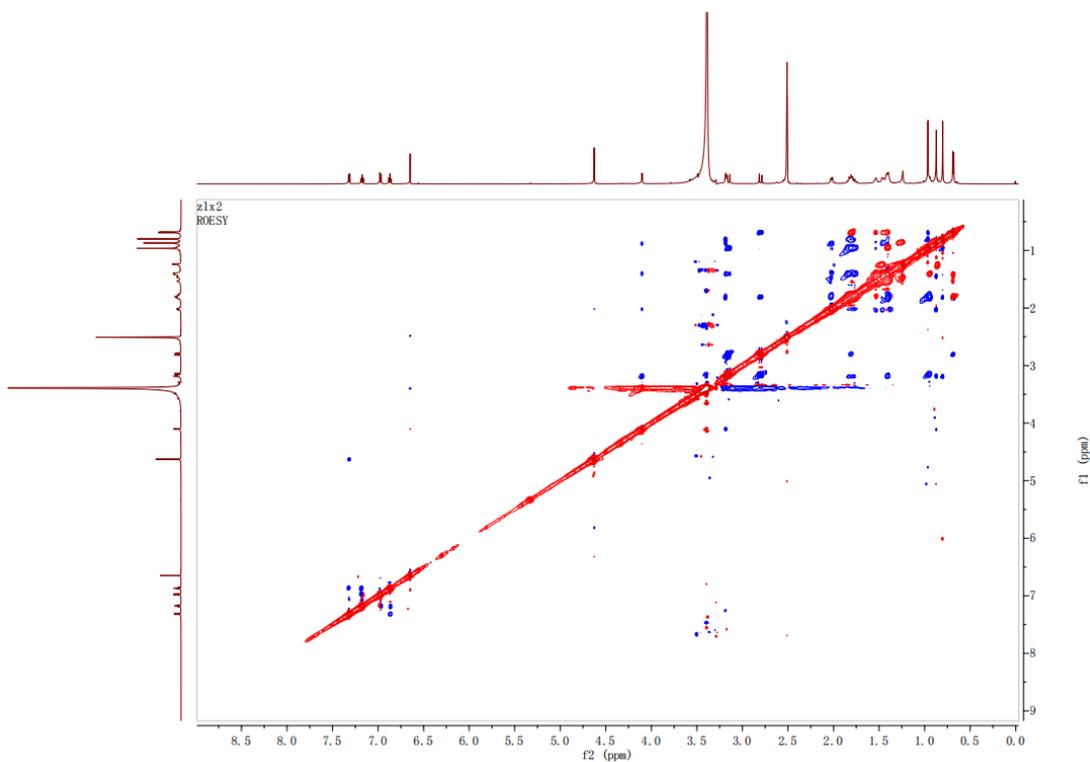


Figure S11 ROSEY Spectrum of stachybotrin K (**1**) in DMSO- d_6

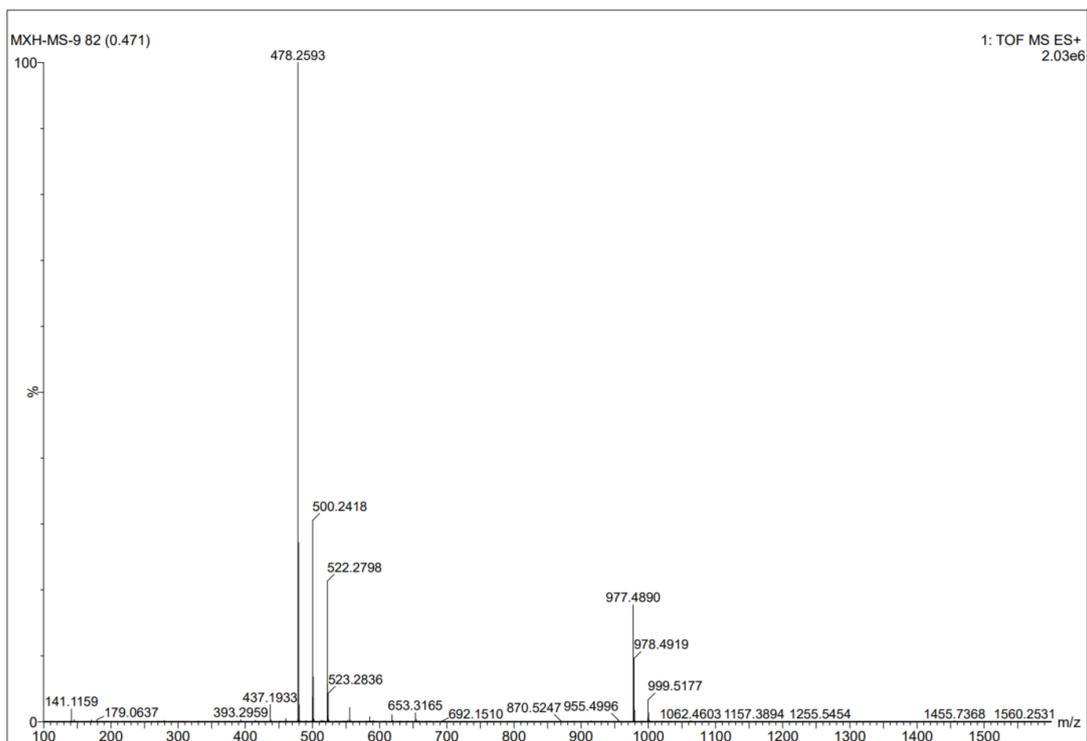


Figure S12 HRESIMS Spectrum of stachybotrin K (**1**)

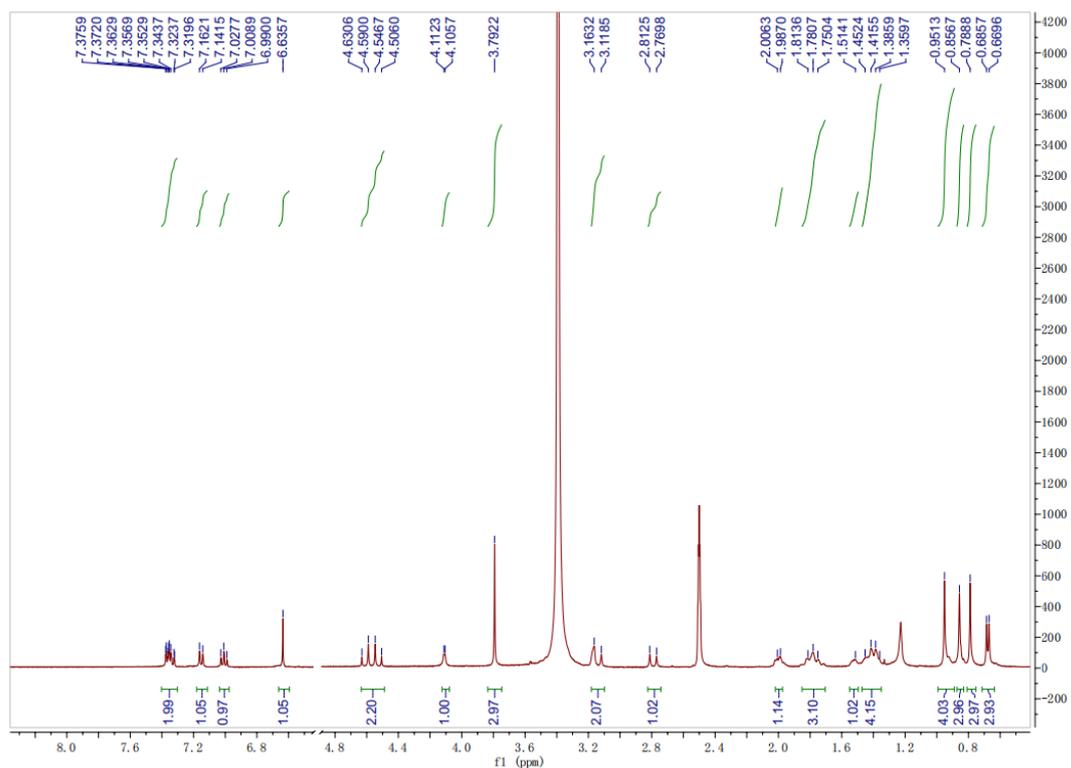


Figure S13 ^1H NMR Spectrum (400 MHz) of stachybotrin L (**2**) in $\text{DMSO-}d_6$

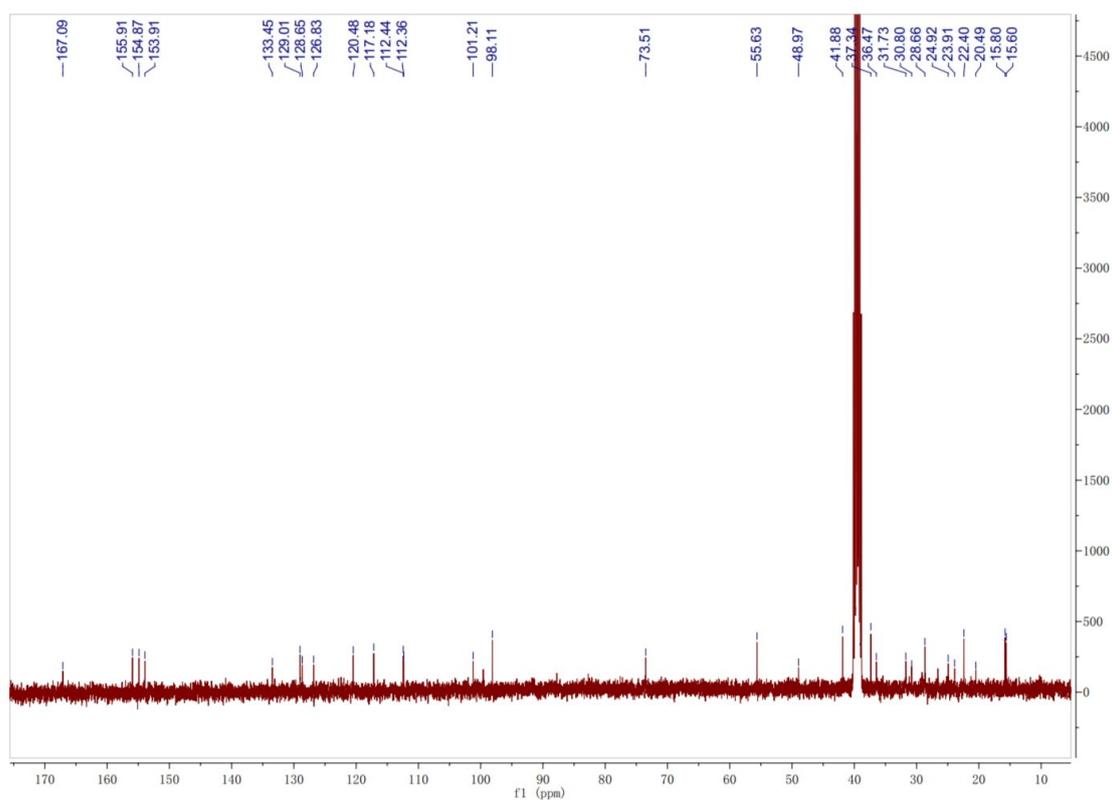


Figure S14 ^{13}C NMR Spectrum (100 MHz) of stachybotrin L (**2**) in $\text{DMSO-}d_6$

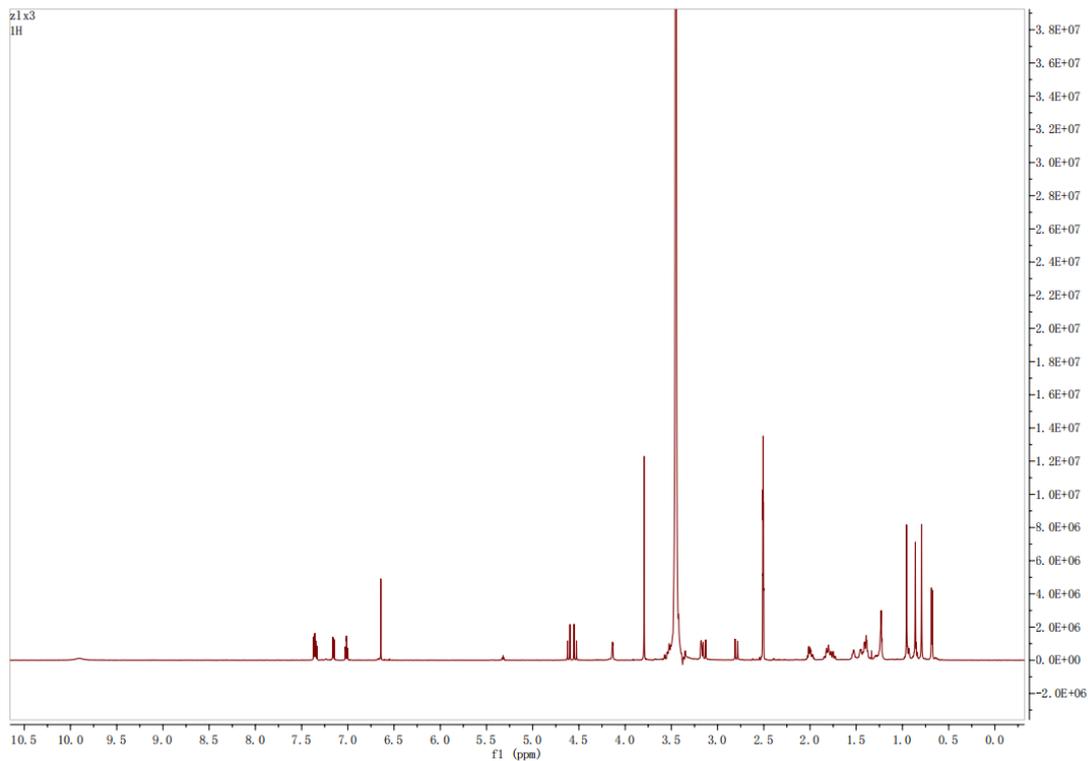


Figure S15 ^1H NMR Spectrum (600 MHz) of stachybotrin L (**2**) in $\text{DMSO-}d_6$

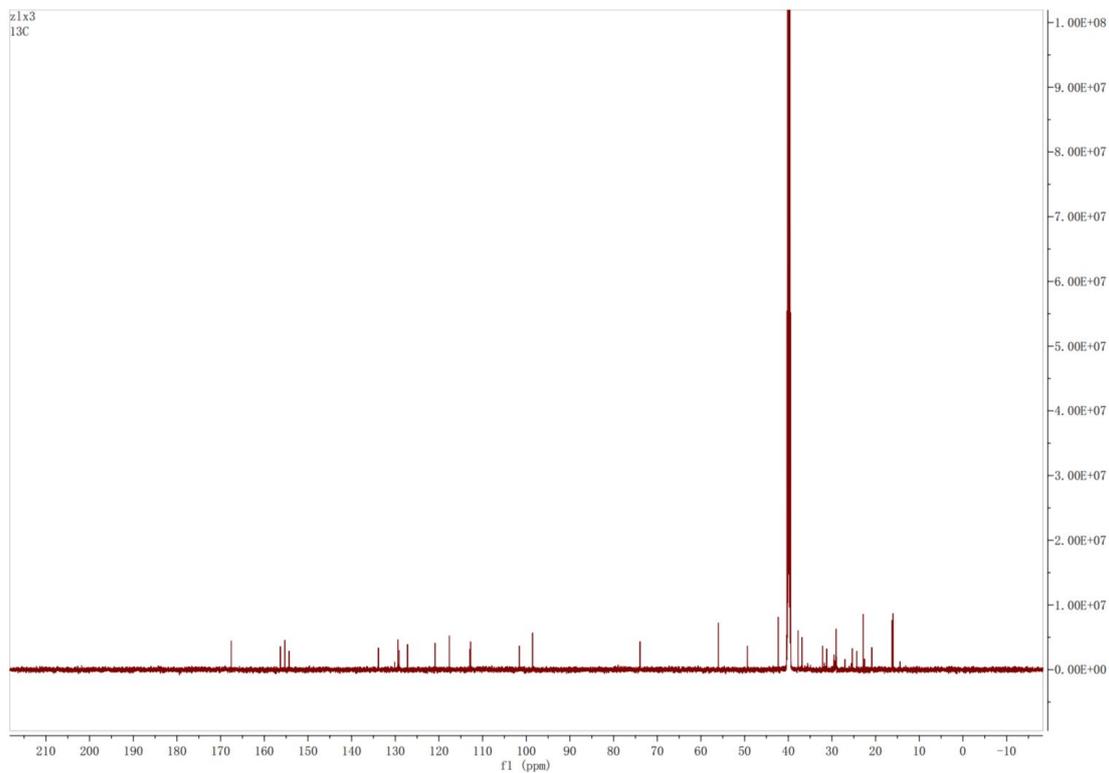


Figure S16 ^{13}C NMR Spectrum (150 MHz) of stachybotrin L (**2**) in $\text{DMSO-}d_6$

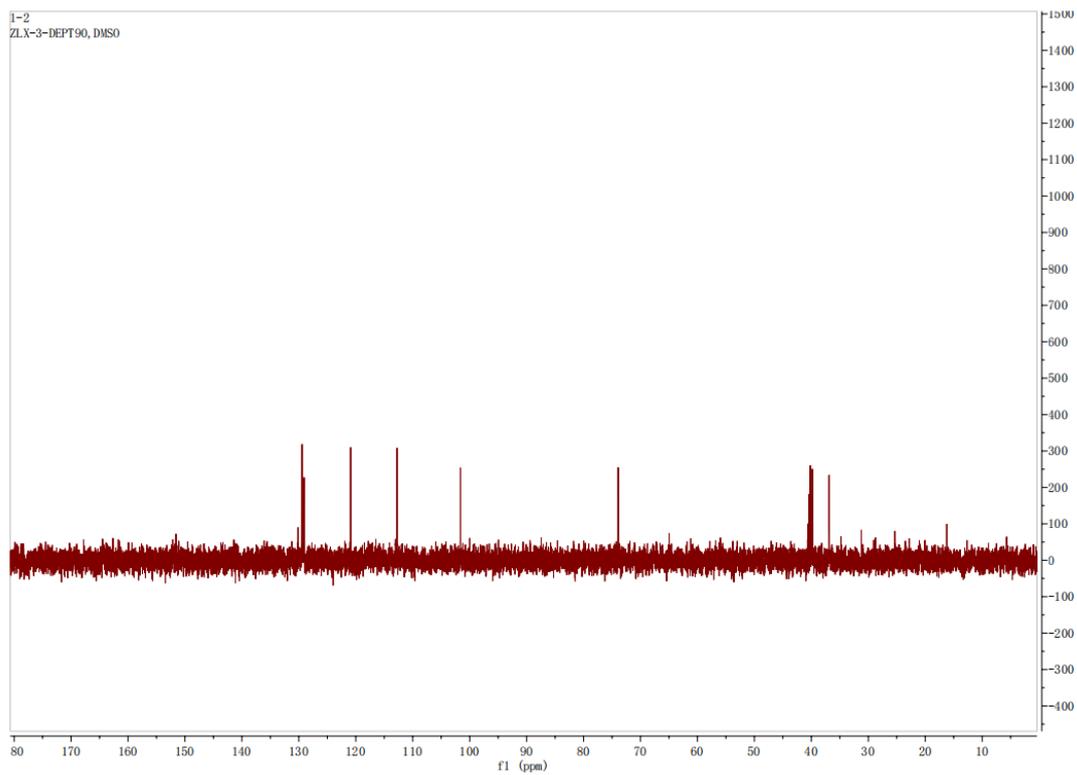


Figure S17 DEPT 90 Spectrum (100 MHz) of stachybotrin L (**2**) in DMSO-*d*₆

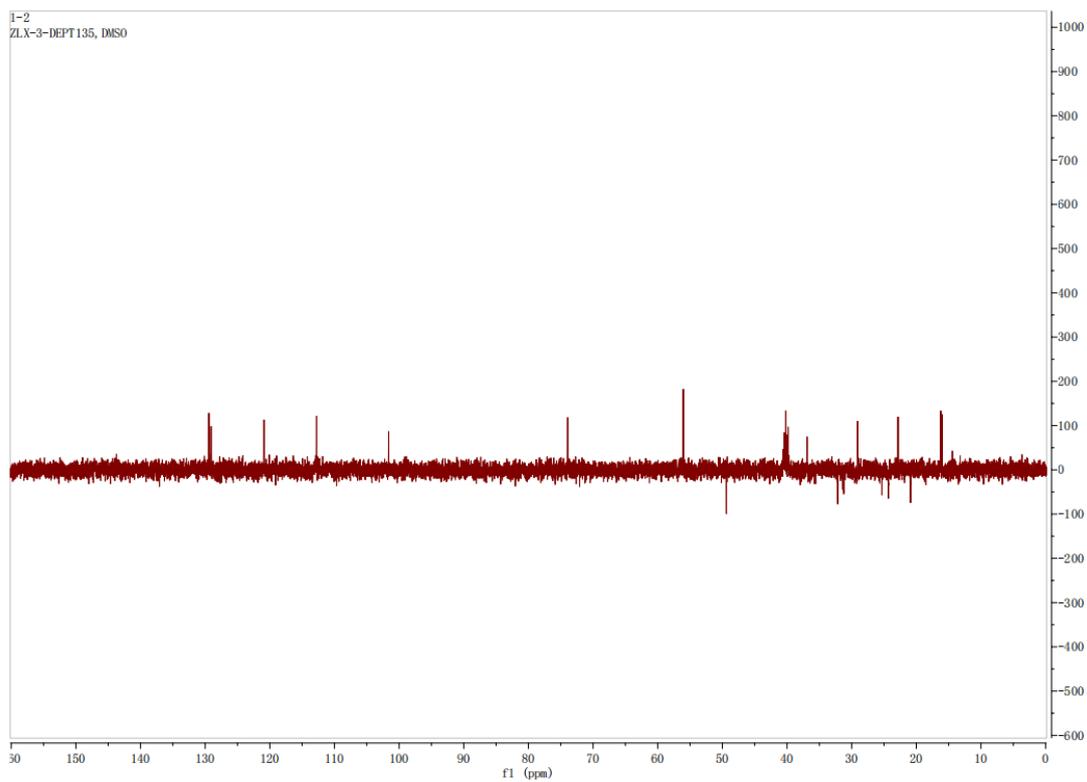


Figure S18 DEPT 135 Spectrum (100 MHz) of stachybotrin L (**2**) in DMSO-*d*₆

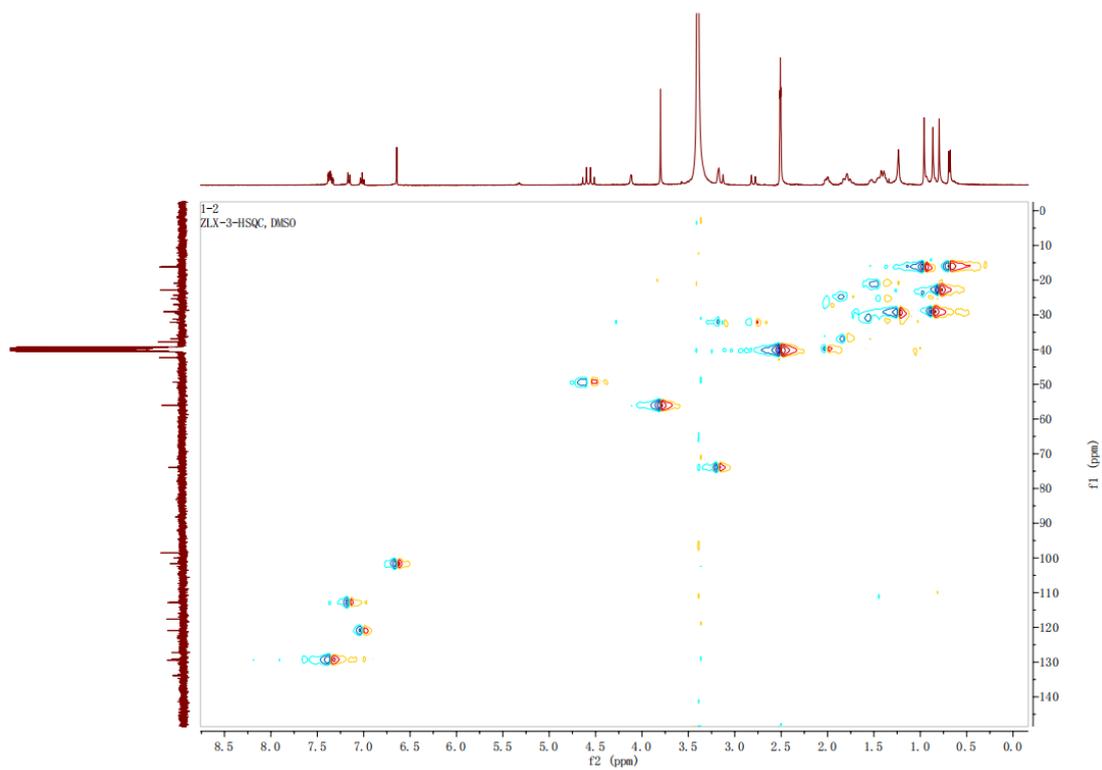


Figure S19 HMQC Spectrum of stachybotrin L (**2**) in DMSO-*d*₆

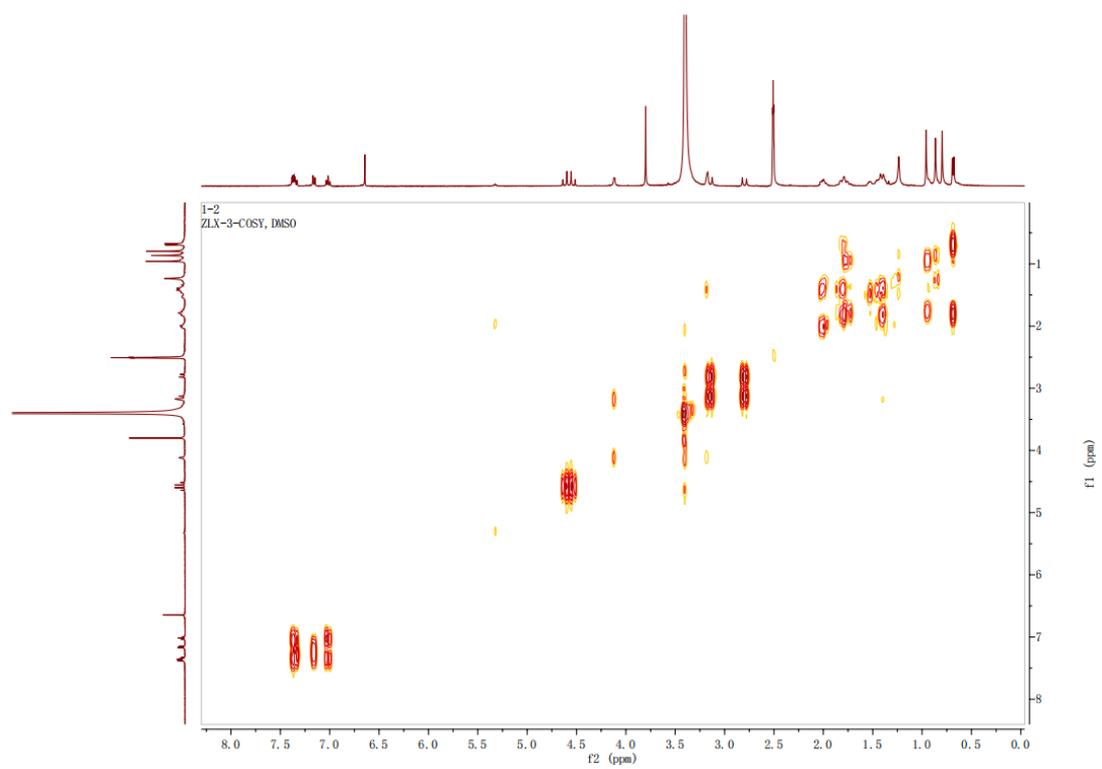


Figure S20 ¹H-¹H COSY Spectrum of stachybotrin L (**2**) in DMSO-*d*₆

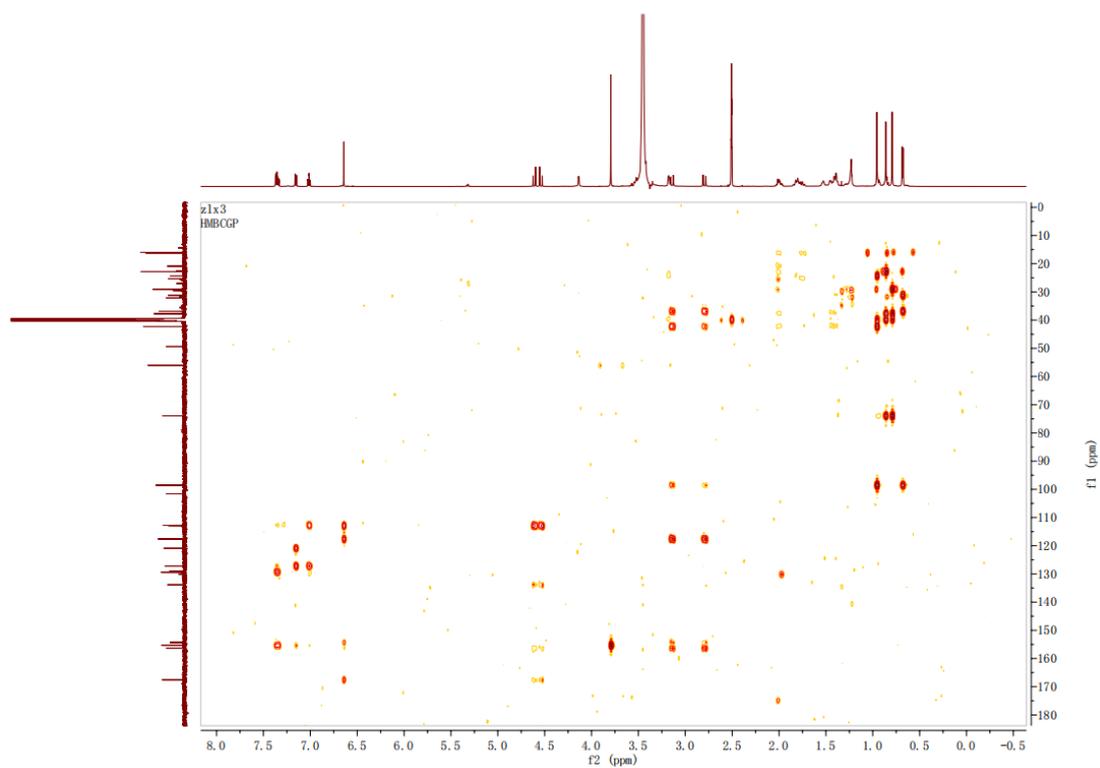


Figure S21 HMBC Spectrum of stachybotrin L (**2**) in DMSO-*d*₆

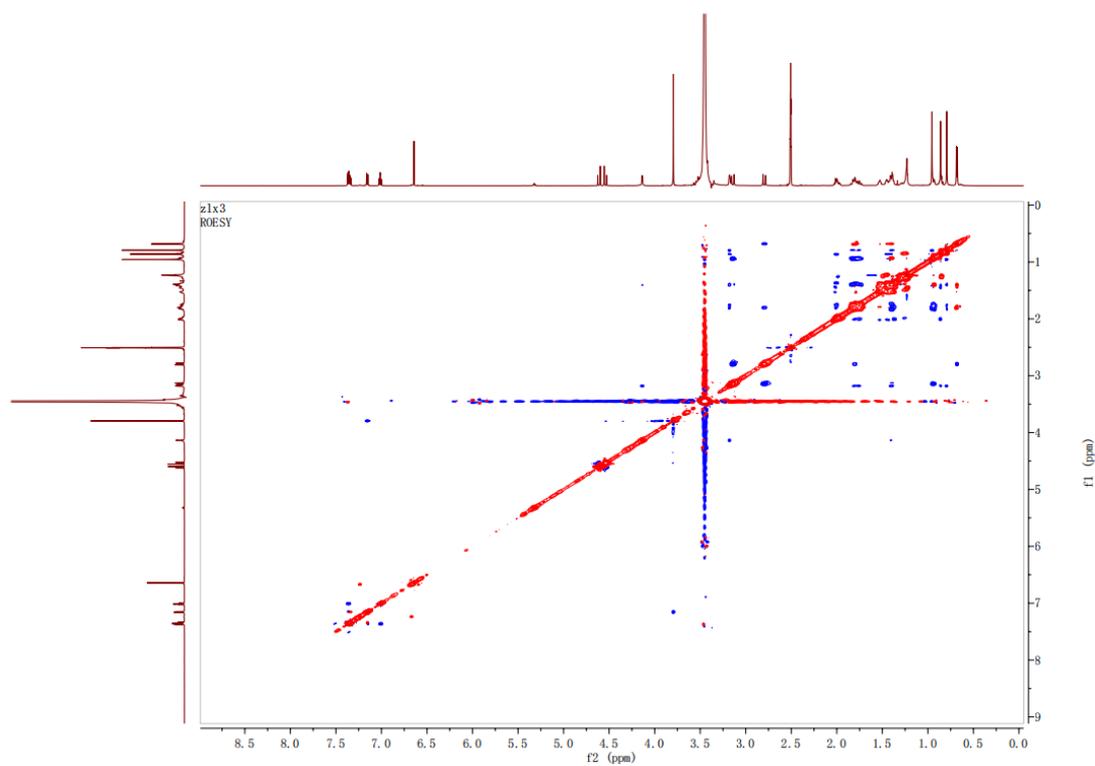


Figure S22 ROSEY Spectrum of stachybotrin L (**2**) in DMSO-*d*₆

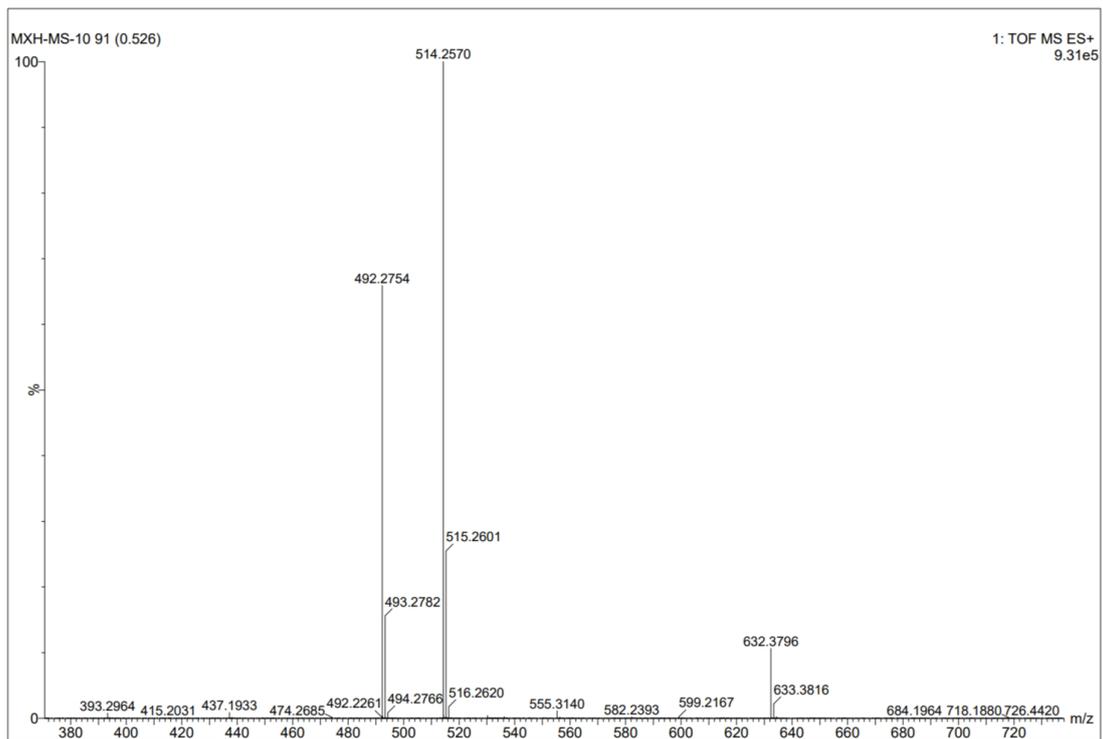


Figure S23 HRESIMS Spectrum of stachybotrin L (2)