

Supplemental material

New dibenzo- α -pyrone derivatives with α -glucosidase inhibitory activities from the marine-derived fungus *Alternaria alternata*

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Table S1 Component for the culture media

Media	Phase	Component
PDB	liquid	20% potato, 2% glucose
YES	liquid	15% sucrose, 2% yeast extract
SWS	liquid	1% starch, 0.1% peptone
YMG	liquid	0.4% glucose, 0.4% yeast extract, 1% maltose
GPY	liquid	1% glucose, 0.5% peptone, 0.1% yeast extract, 0.1% CaCO ₃
Rice	solid	rice 100 g, distilled H ₂ O 110 mL

The liquid media incubated at 28°C for 7 days under on an orbital shaker at 200 rpm; The solid media incubated at 25°C under static condition for 30 days.

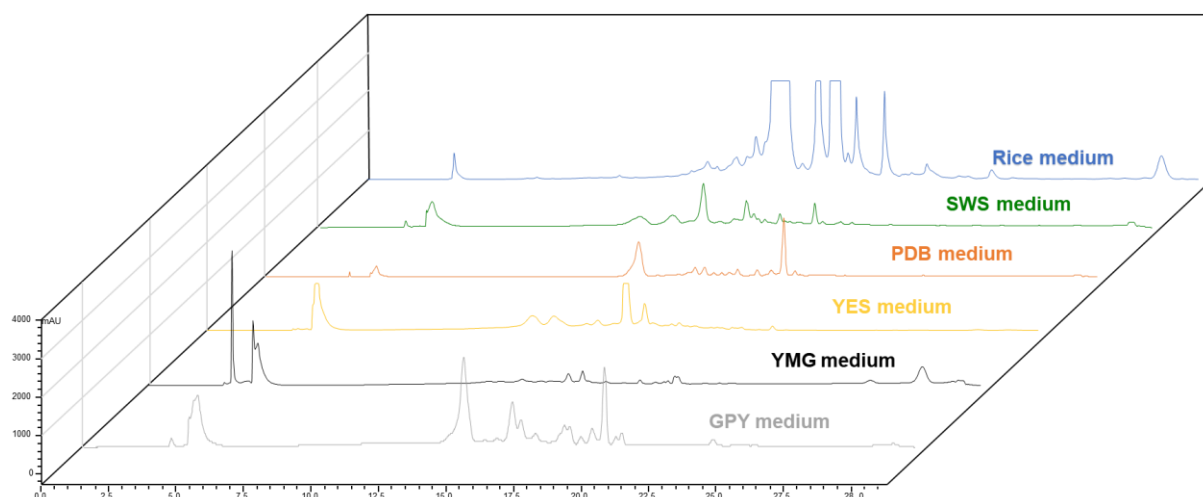


Figure S1. HPLC-UV analysis of metabolic profiles cultured in six media at 280 nm

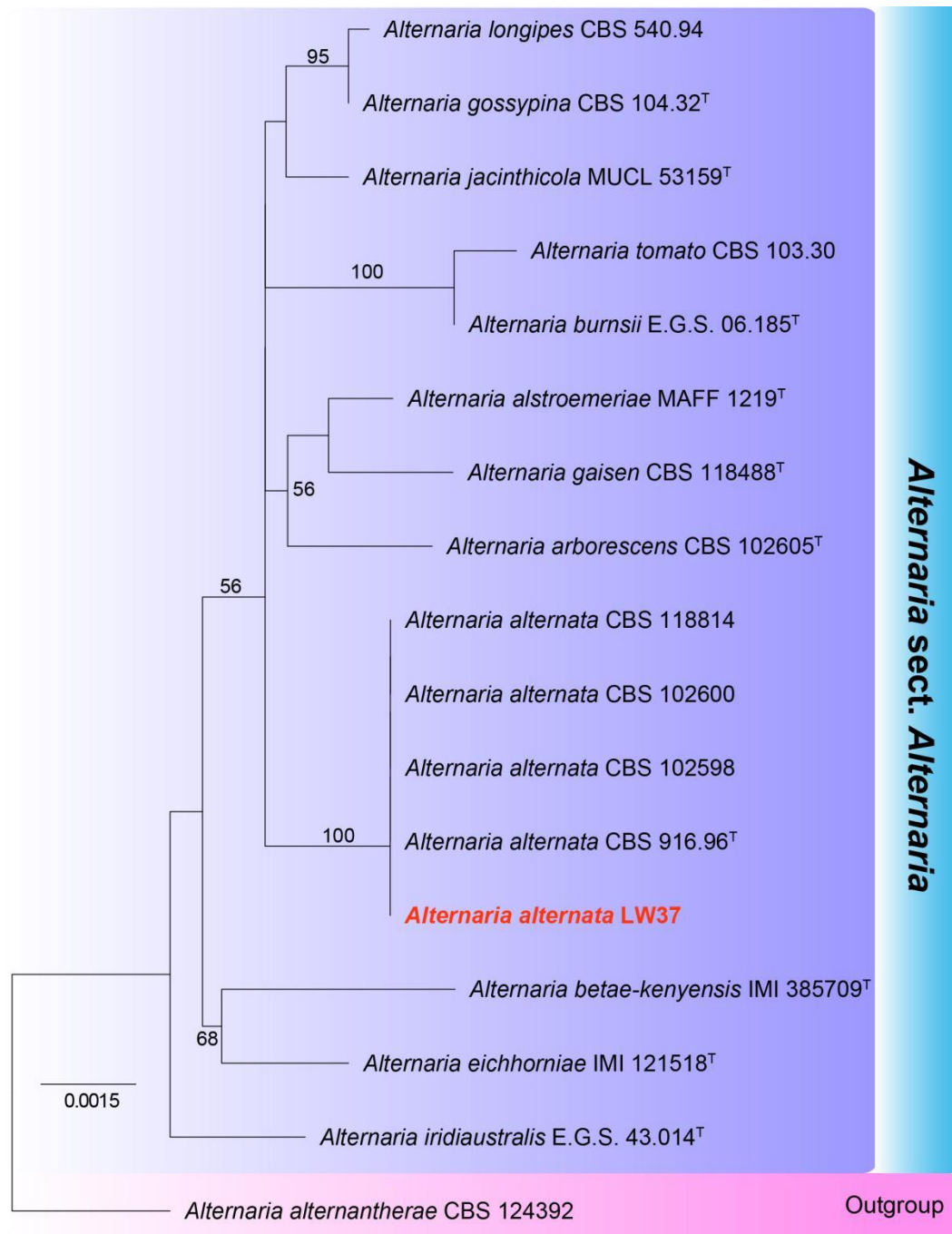


Figure S2. Maximum likelihood tree of *Alternaria* sect. *Alternaria* based on sequences of *LSU*, *SSU*, *ITS* and *RPB2*. Bootstrap support values of maximum likelihood (MLBP) above 50% are shown at the nodes. The tree was rooted to *Alternaria alternantherae* CBS 124392. Type cultures are indicated with a letter "T" after the accession number. The strain LW37 is printed in red and bold font.

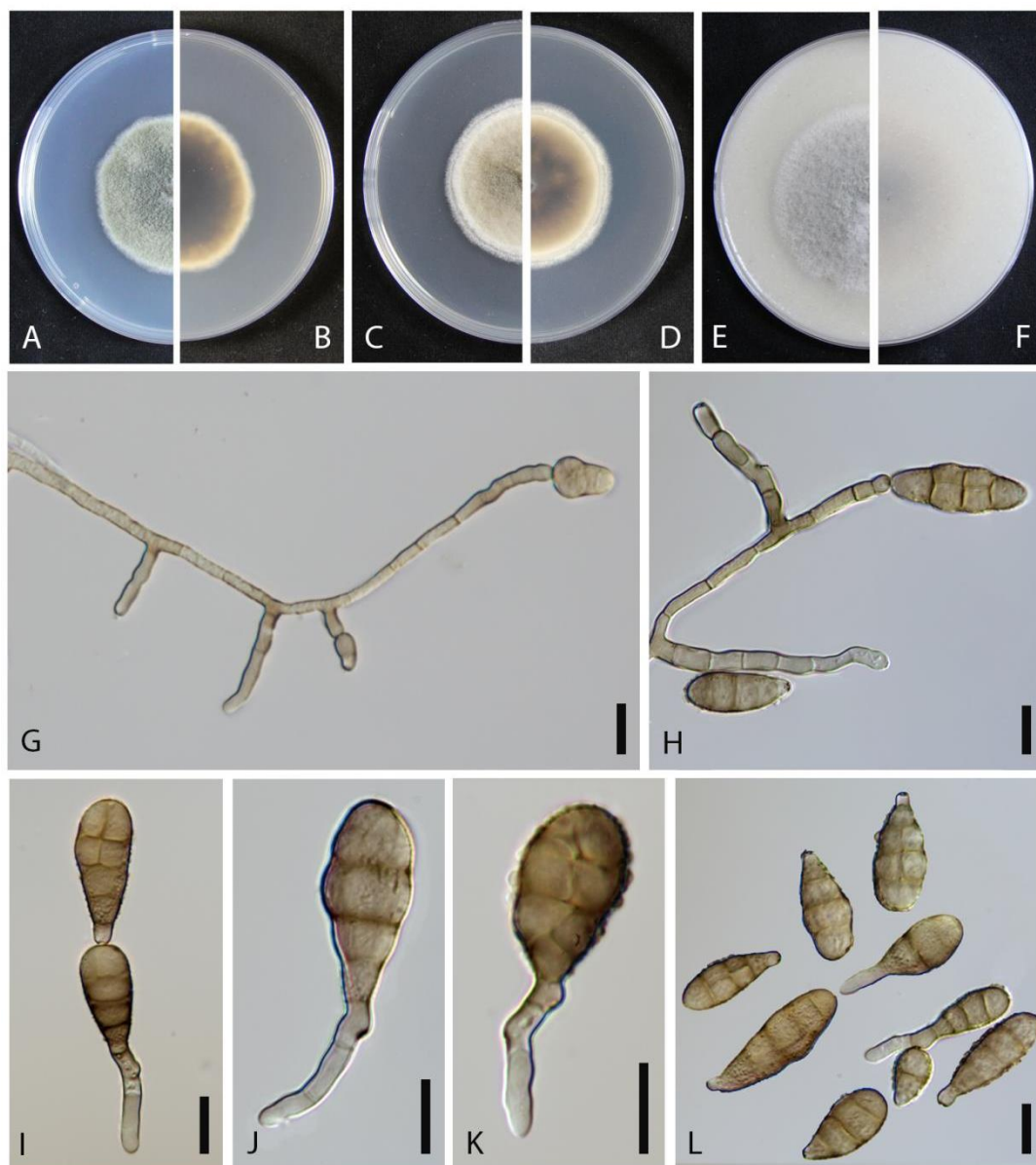


Figure S3. The colony and spore morphology of strain *Alternaria alternata* LW37. A, Surface and reverse of colony on PDA, MEA, OA and CYA. B, Sporulation on MEA. C-F, Conidiophores and conidiogenous cells. G, Conidia. Scale bars: C-G = 10 μm.

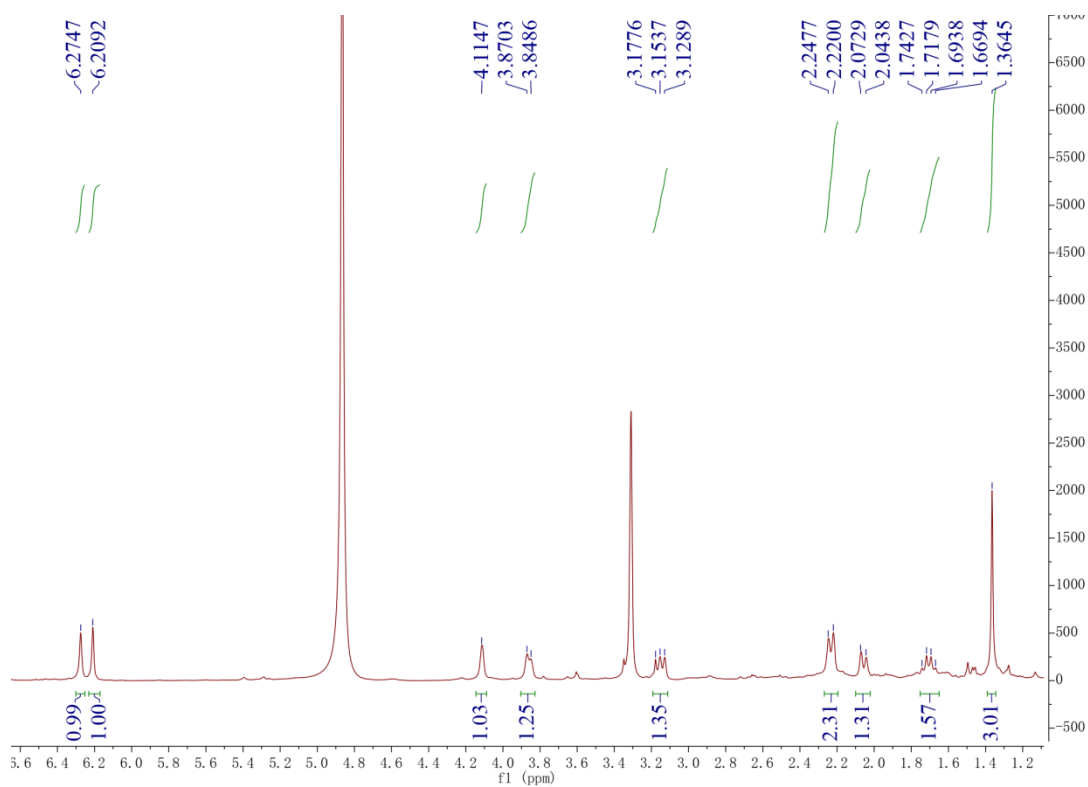


Figure S4. ¹H NMR spectrum of alternolide A (1; 500 MHz, CD₃OD)

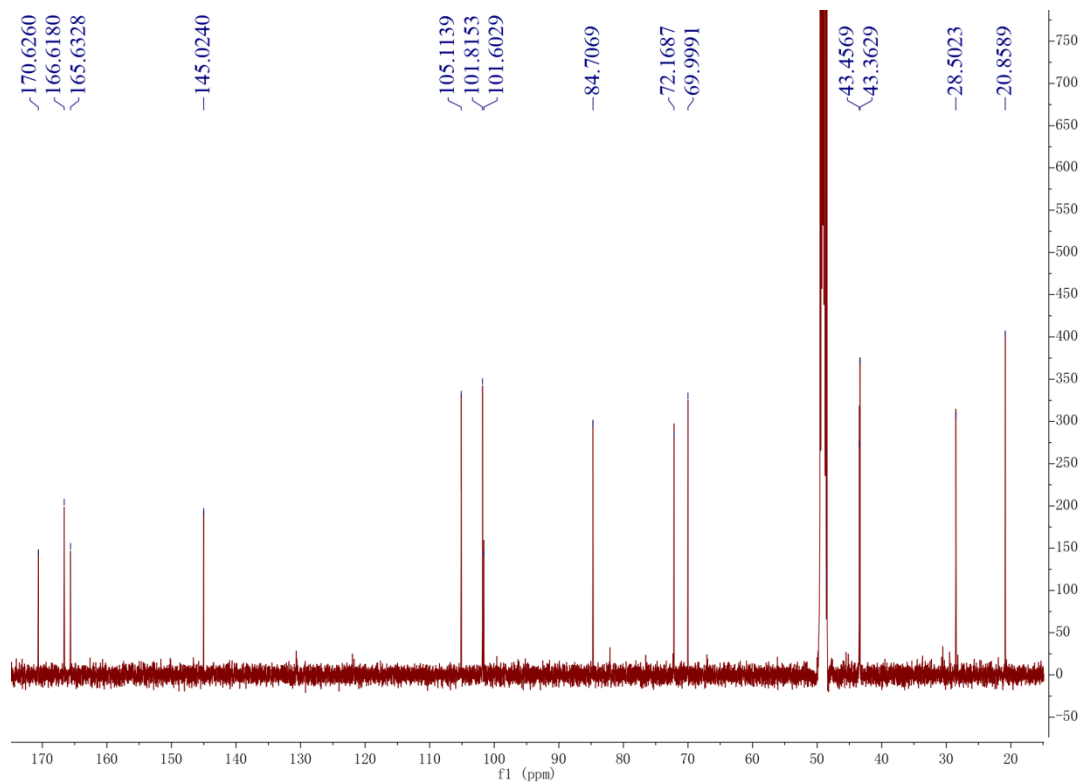


Figure S5. ¹³C NMR spectrum of alternolide A (1; 125 MHz, CD₃OD)

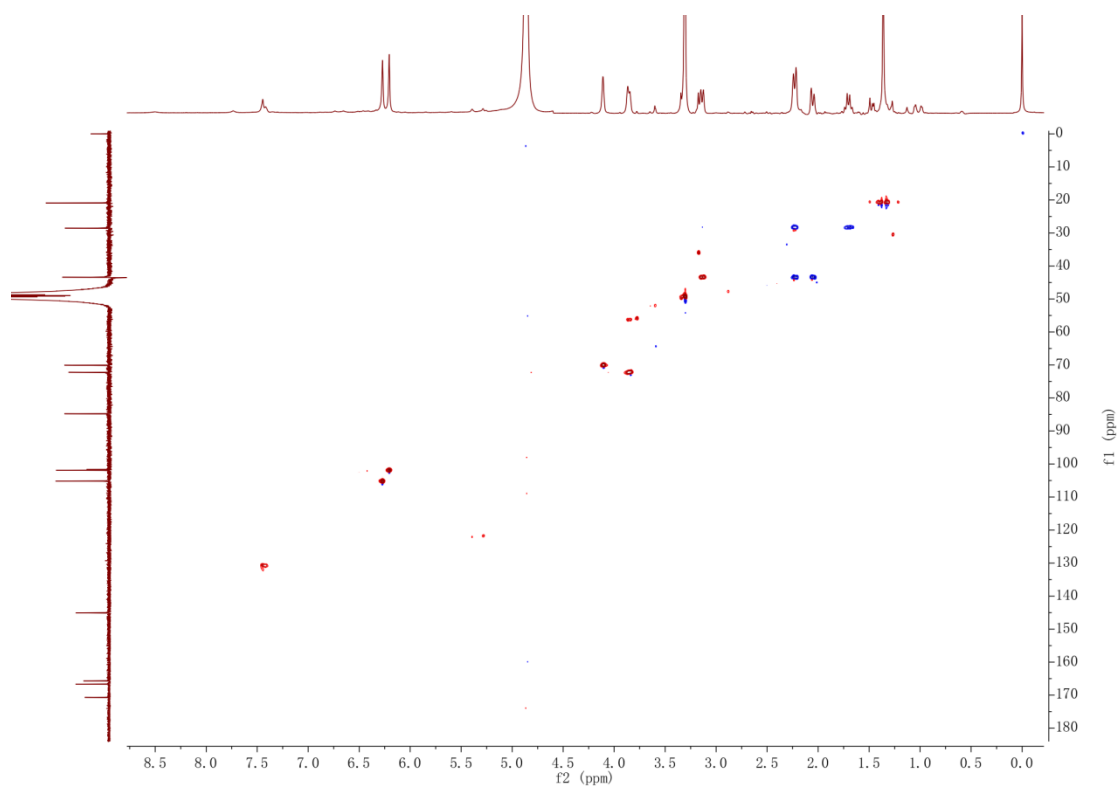


Figure S6. HSQC spectrum of alternolide A (1; 500 MHz, CD₃OD)

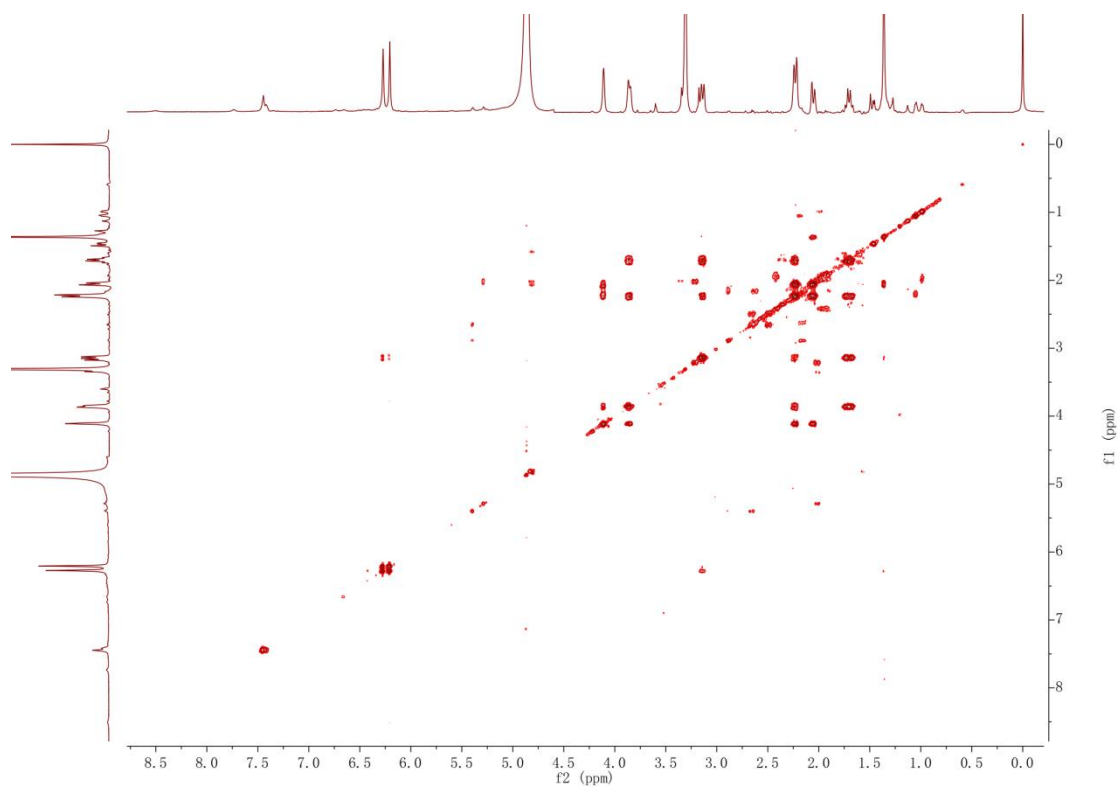


Figure S7. ¹H-¹H COSY spectrum of alternolide A (1; 500 MHz, CD₃OD)

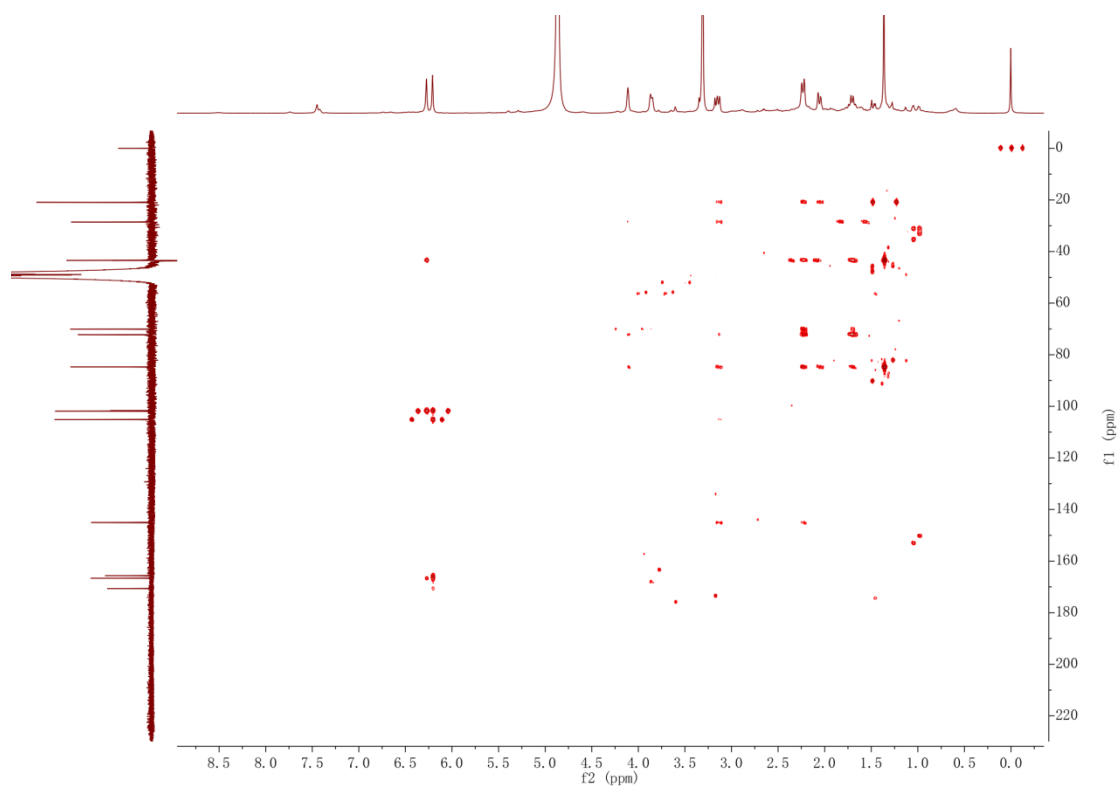


Figure S8. HMBC spectrum of alternolide A (**1**; 500 MHz, CD₃OD)

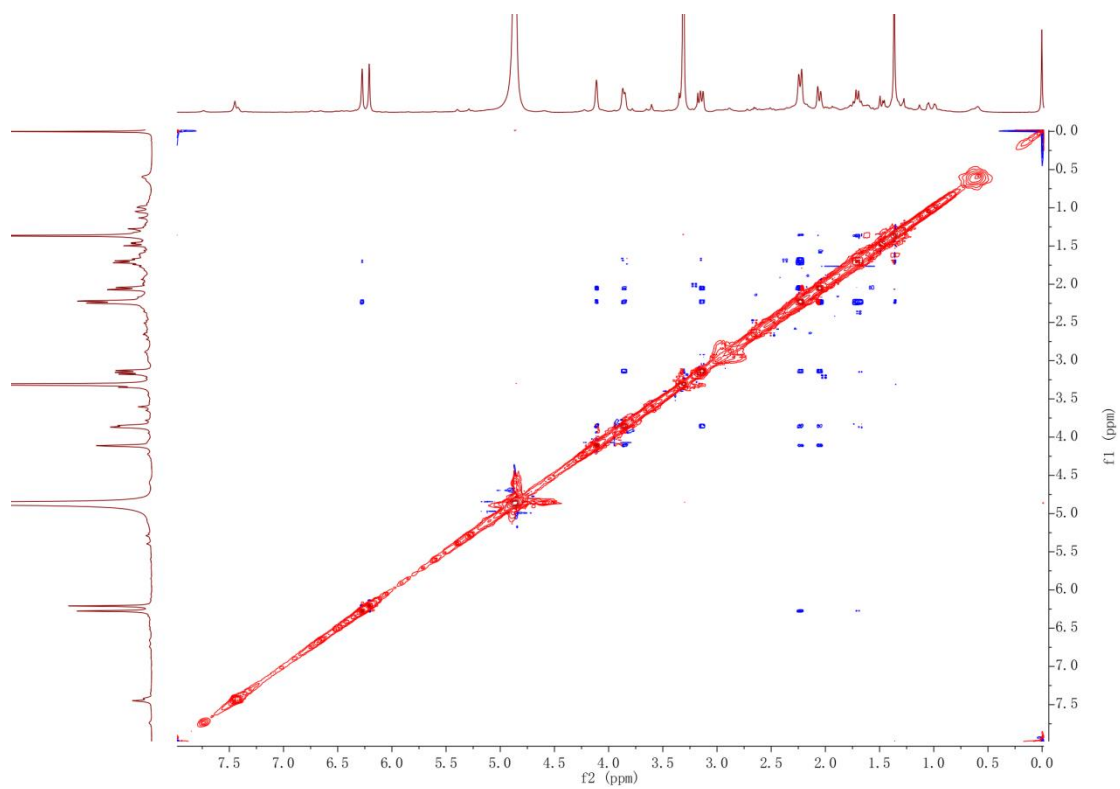


Figure S9. NOESY spectrum of alternolide A (**1**; 500 MHz, CD₃OD)

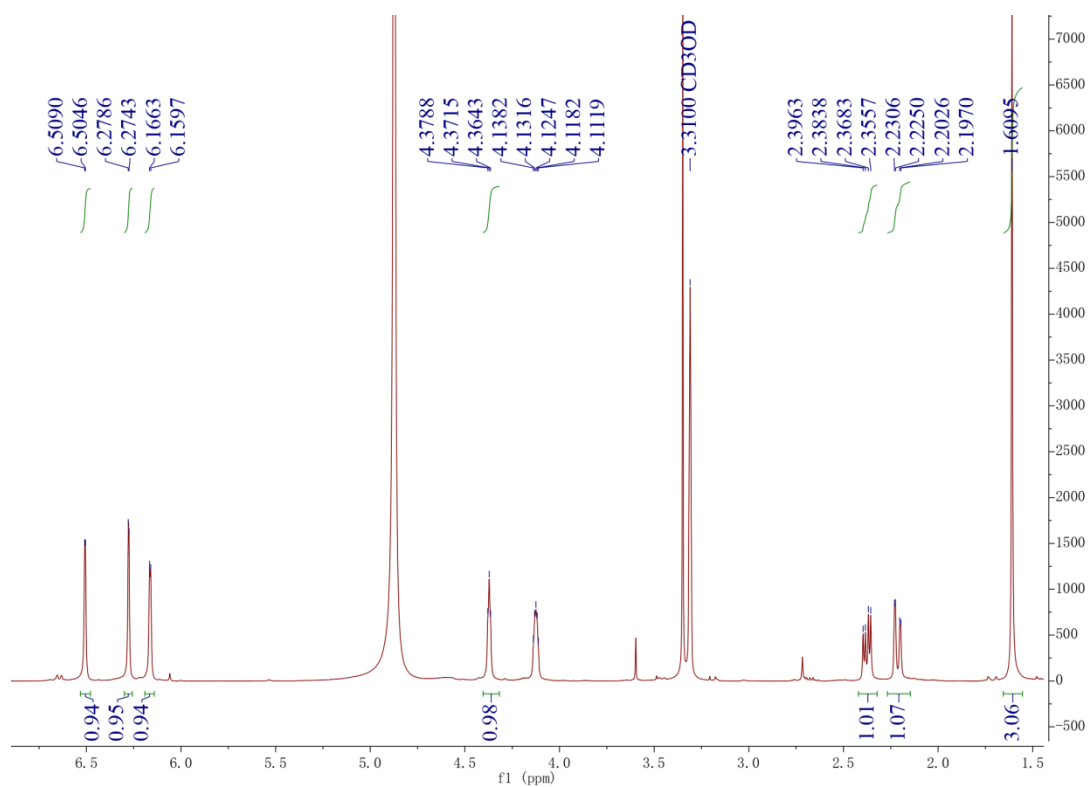


Figure S10. ¹H NMR spectrum of alternolide B (**2**; 500 MHz, CD₃OD)

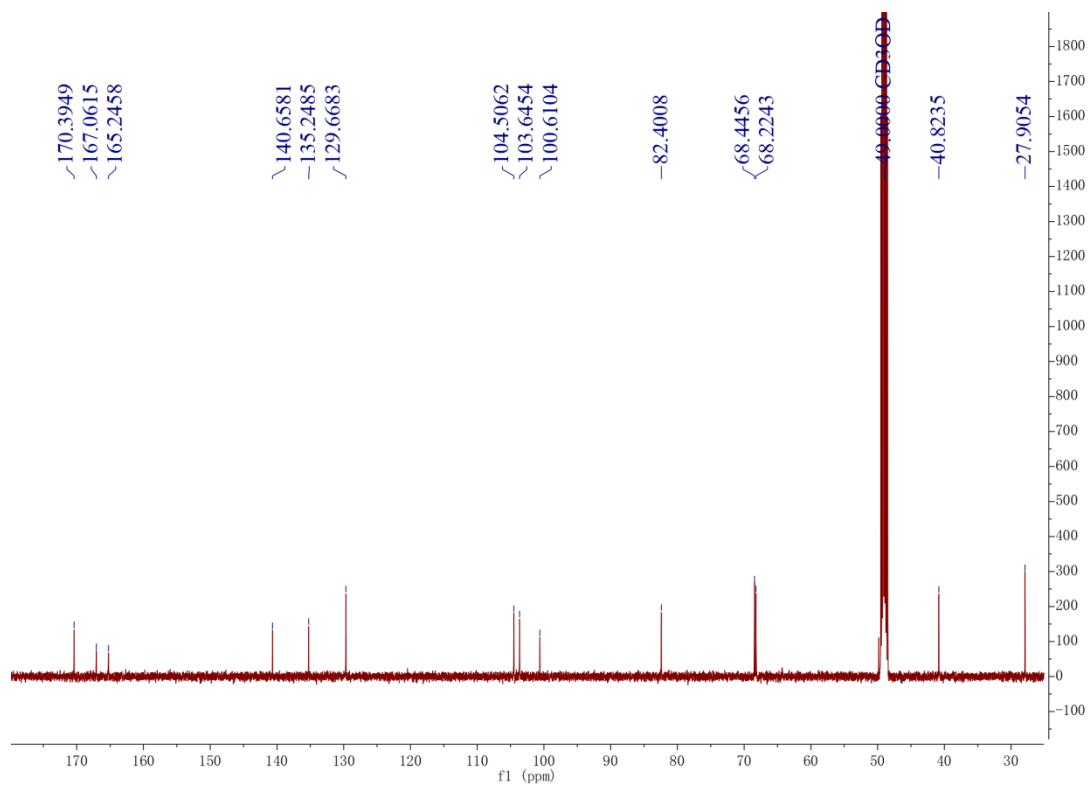


Figure S11. ¹³C NMR spectrum of alternolide B (**2**; 125 MHz, CD₃OD)

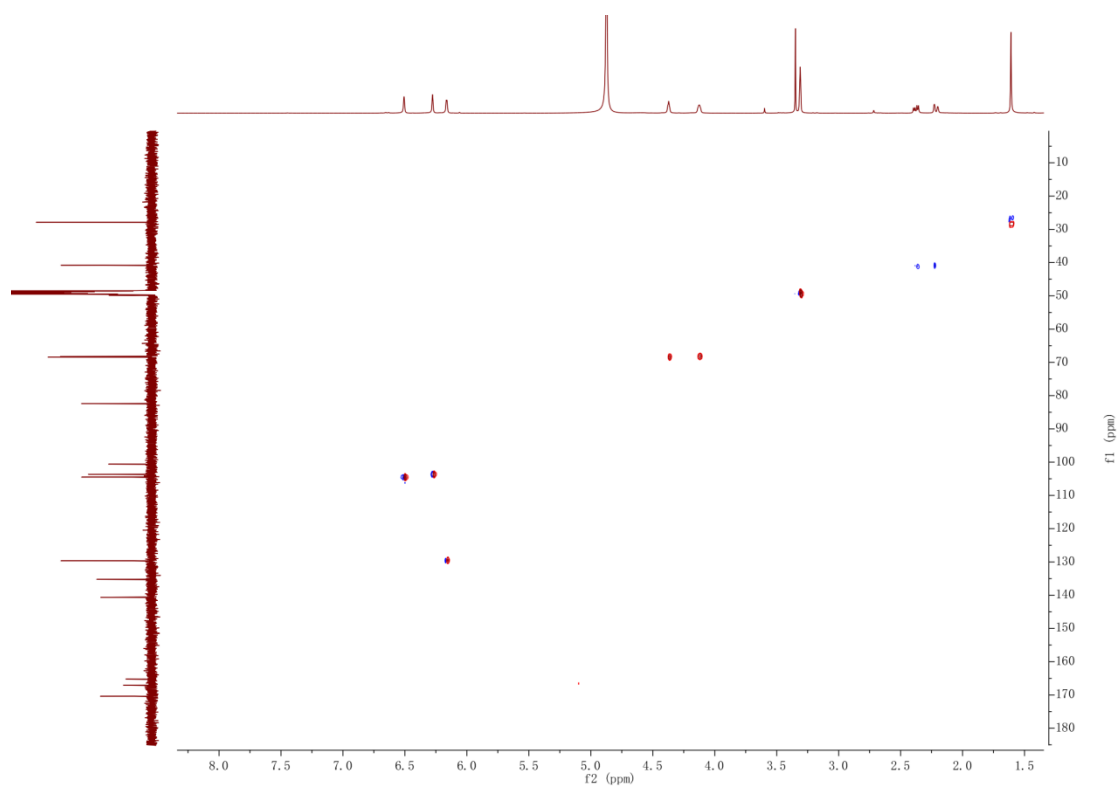


Figure S12. HSQC spectrum of alternolide B (**2**; 500 MHz, CD₃OD)

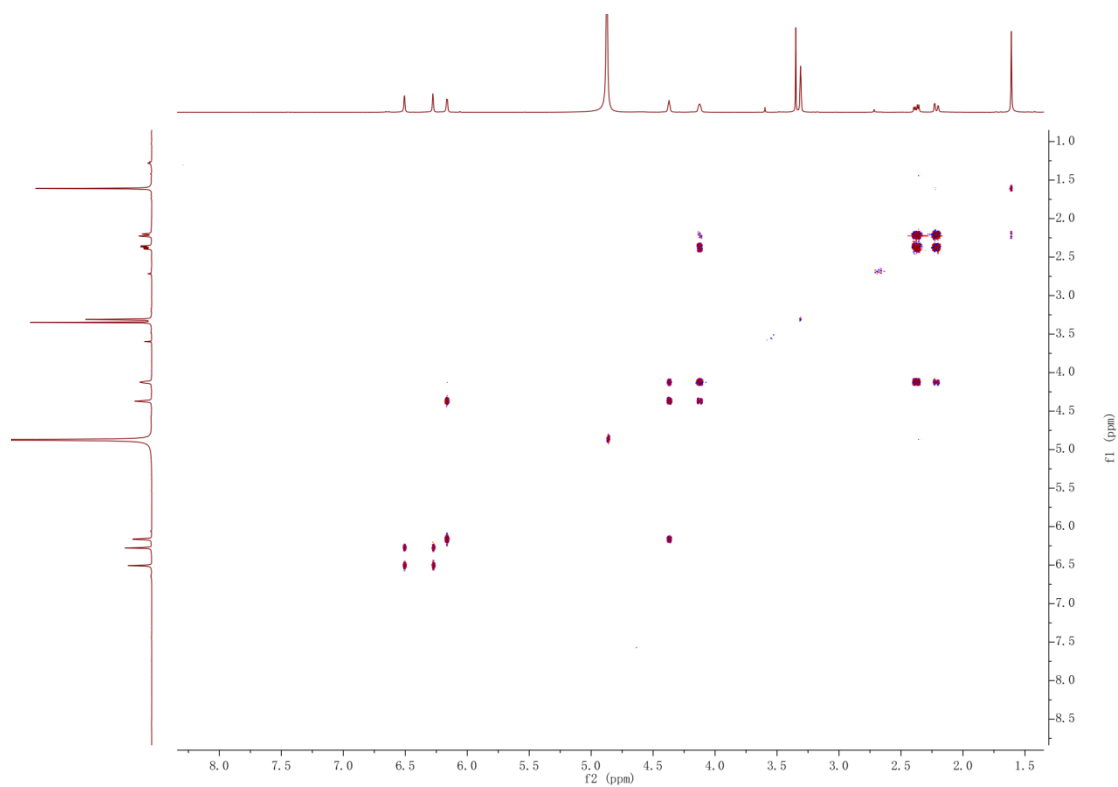


Figure S13. ¹H-¹H COSY spectrum of alternolide B (**2**; 500 MHz, CD₃OD)

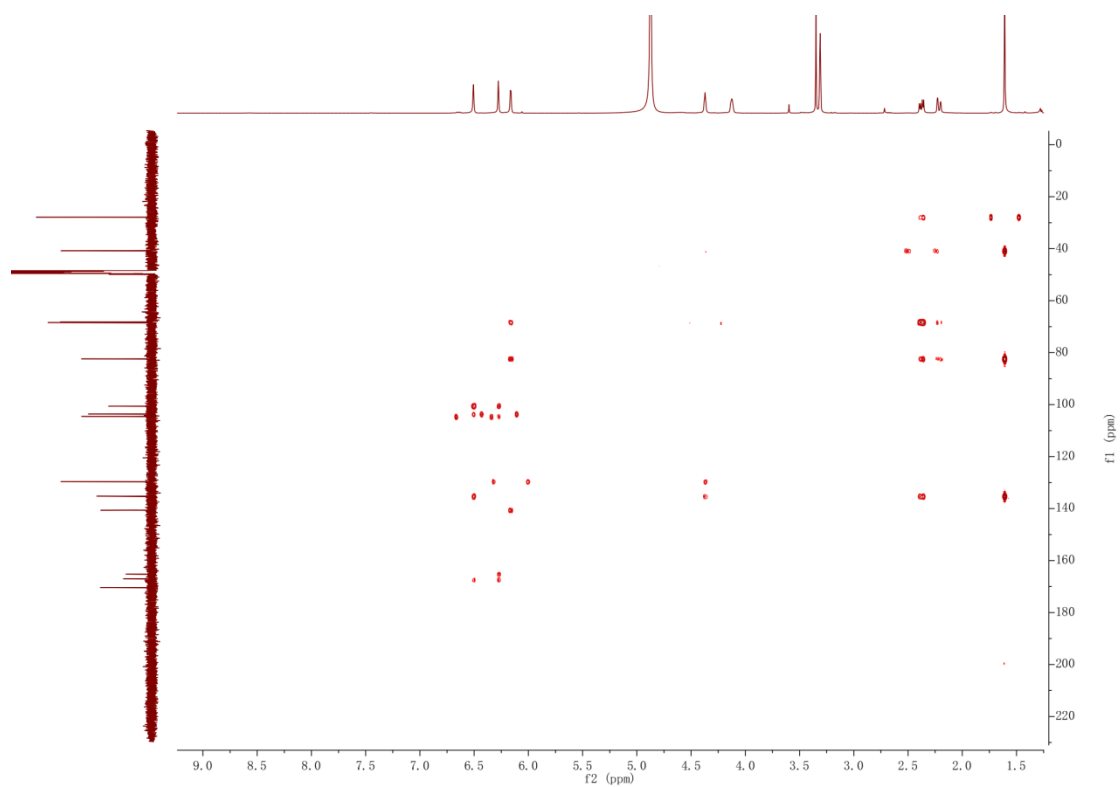


Figure S14. HMBC spectrum of alternolide B (**2**; 500 MHz, CD₃OD)

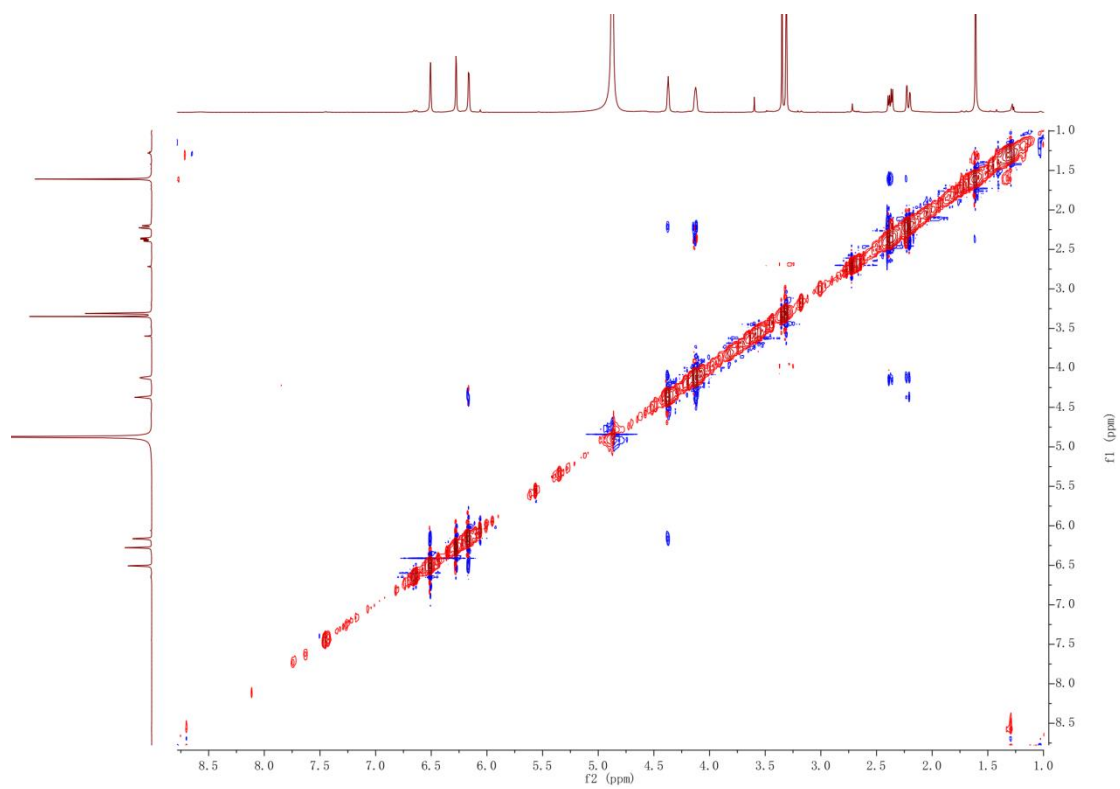


Figure S15. NOESY spectrum of alternolide B (**2**; 500 MHz, CD₃OD)

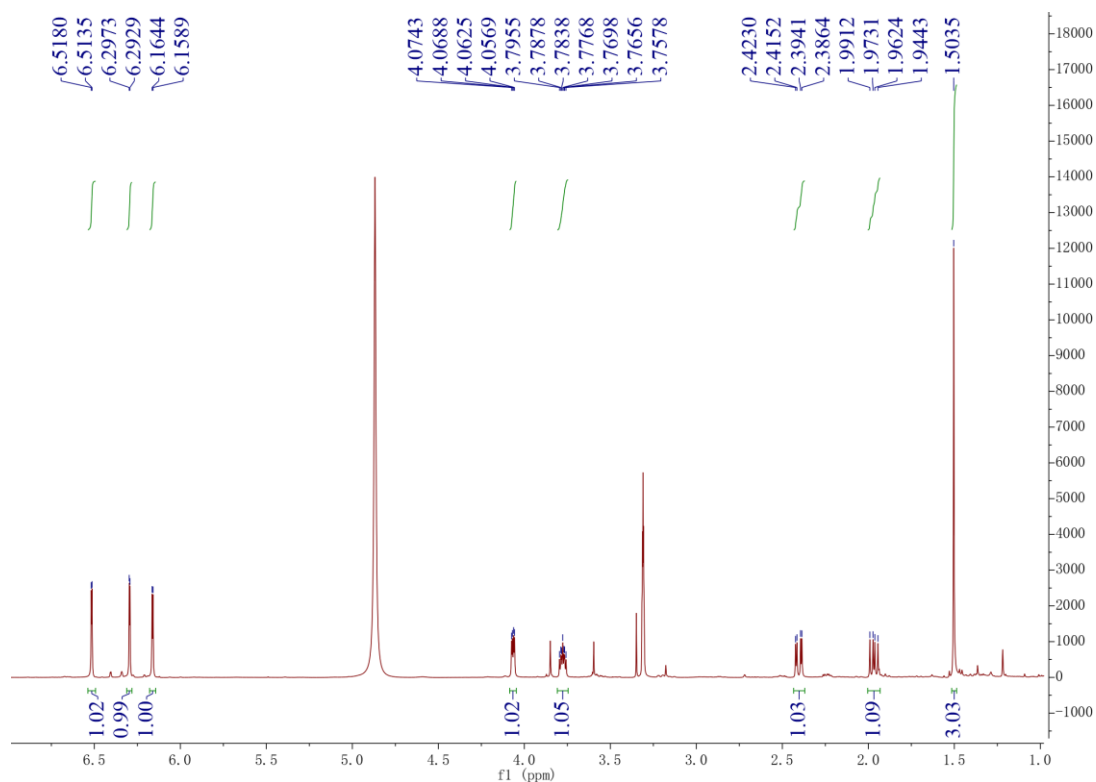


Figure S16. ¹H NMR spectrum of alternolide B (**3**; 500 MHz, CD₃OD)

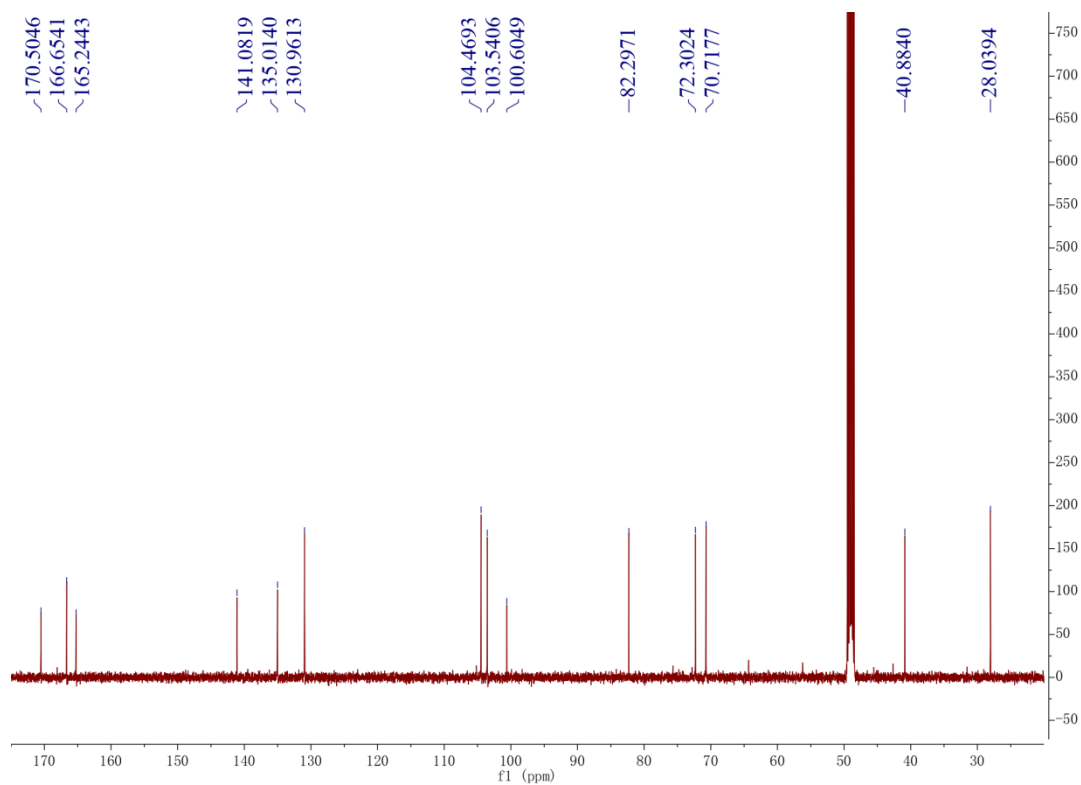


Figure S17. ¹³C NMR spectrum of alternolide C (**3**; 125 MHz, CD₃OD)

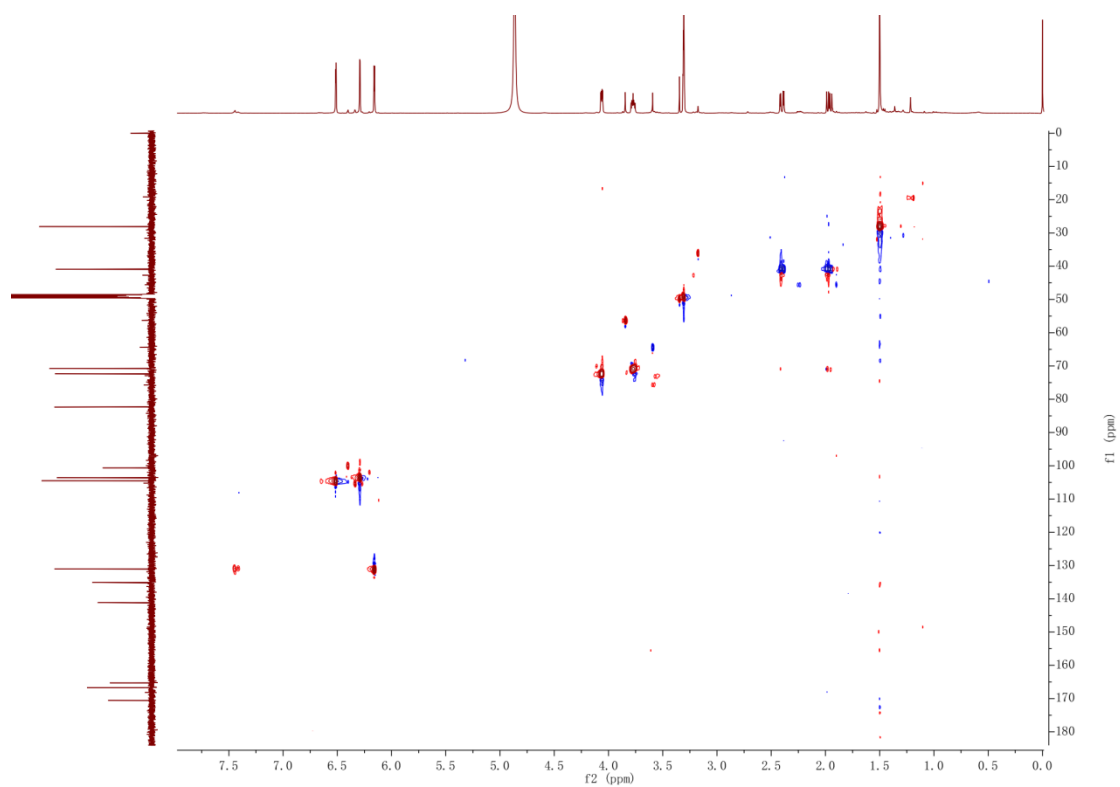


Figure S18. HSQC spectrum of alternolide C (**3**; 500 MHz, CD₃OD)

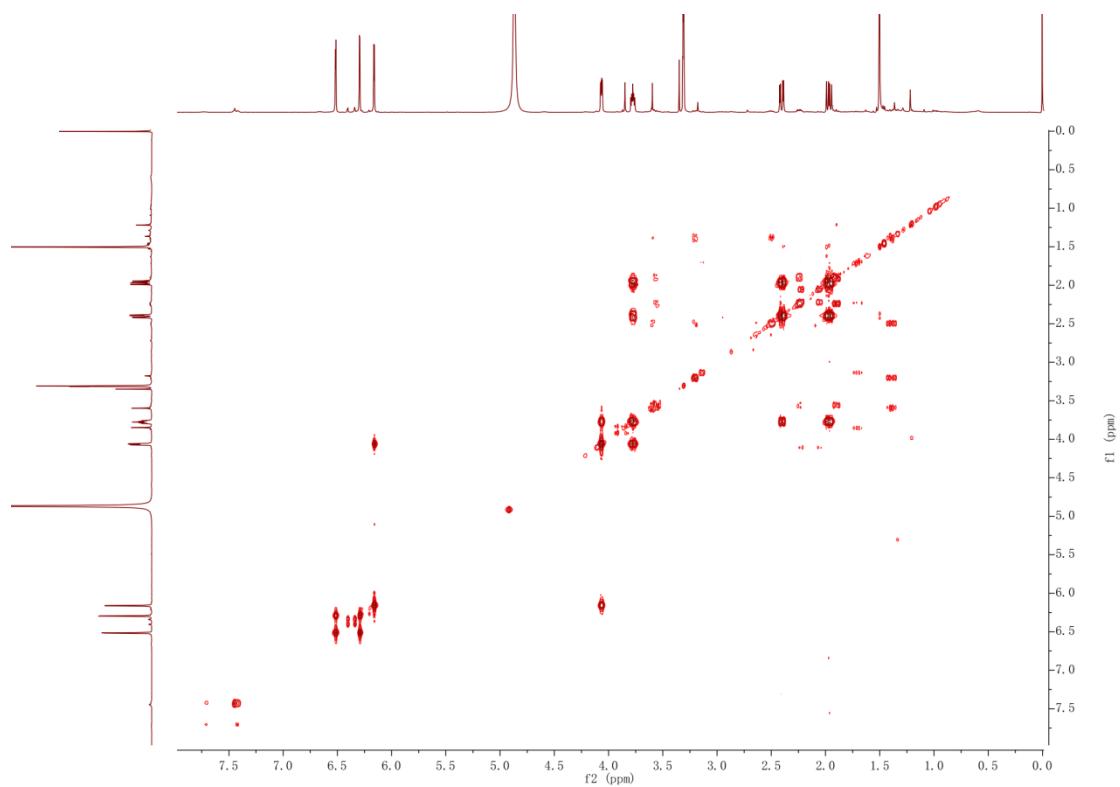


Figure S19. ¹H-¹H COSY spectrum of alternolide C (**3**; 500 MHz, CD₃OD)

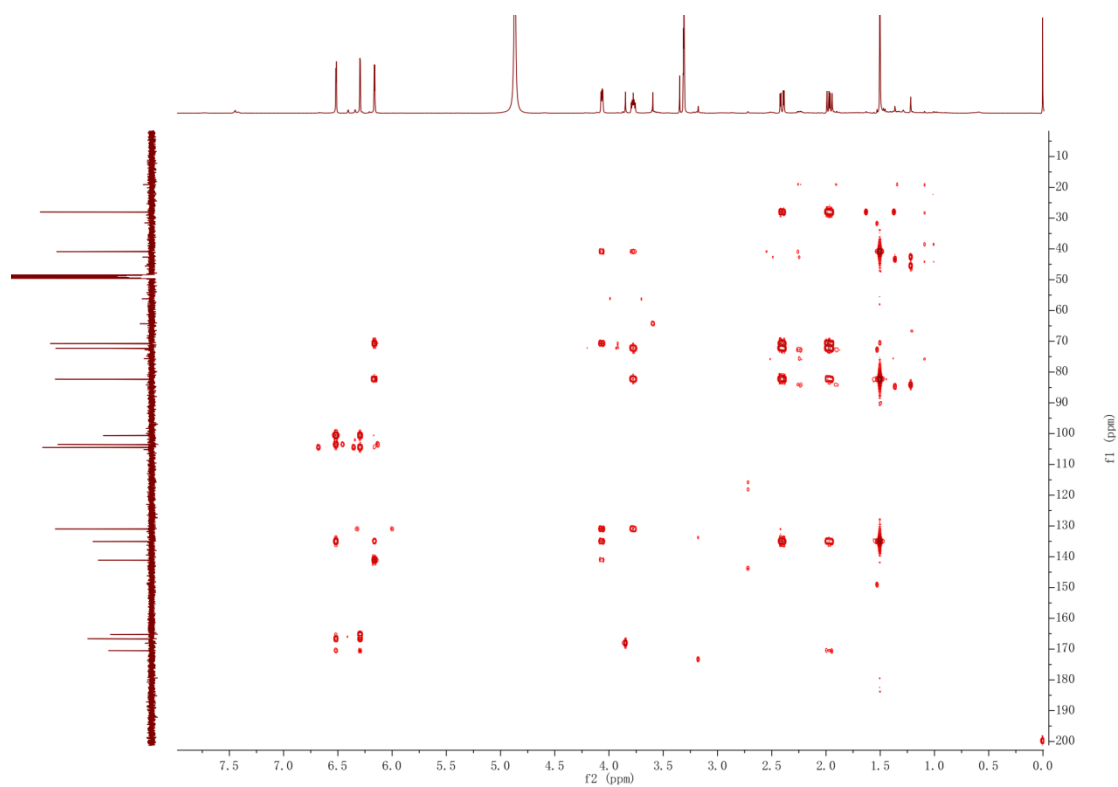


Figure S20. HMBC spectrum of alternolide C (3; 500 MHz, CD₃OD)

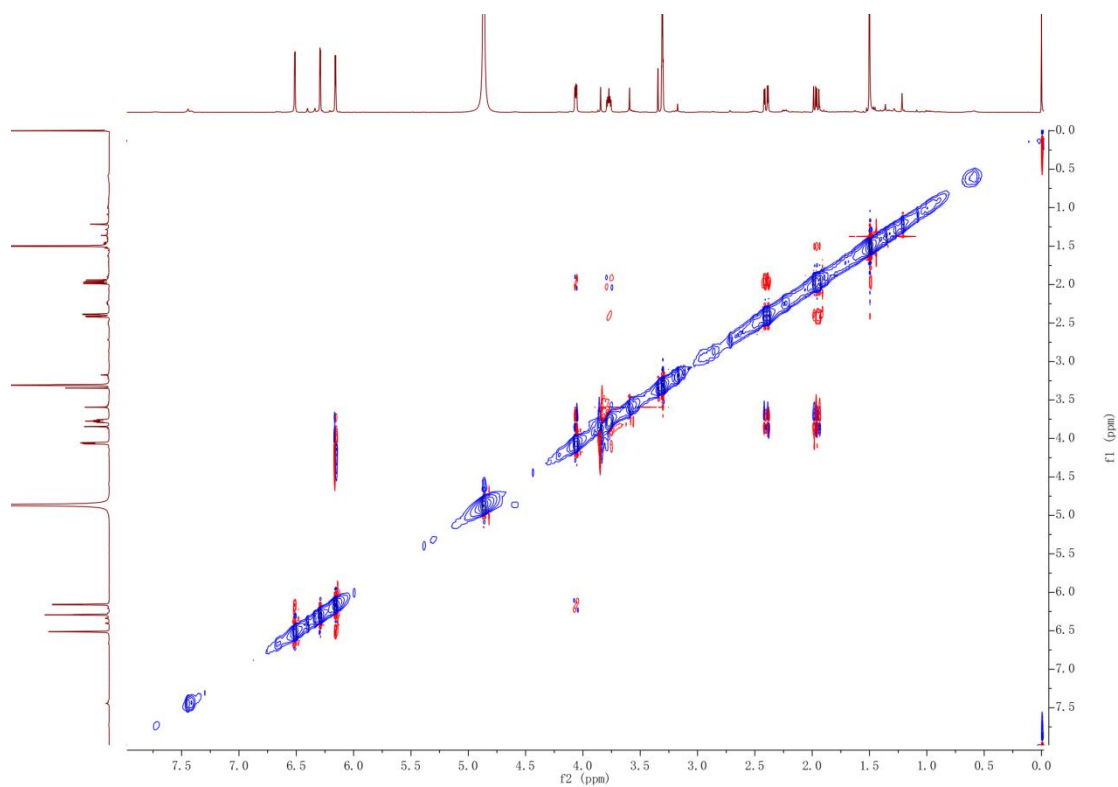


Figure S21. NOESY spectrum of alternolide C (3; 500 MHz, CD₃OD)

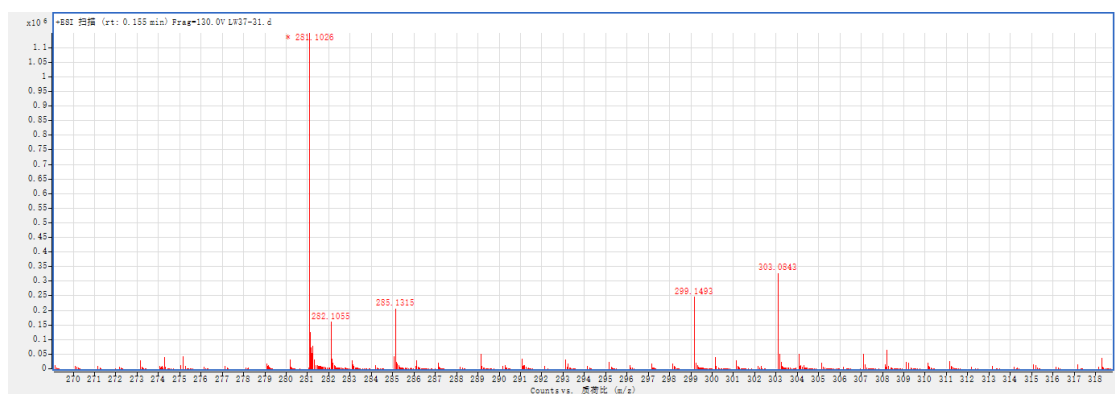


Figure S22. HRESIMS spectrum of alternolide A (1)

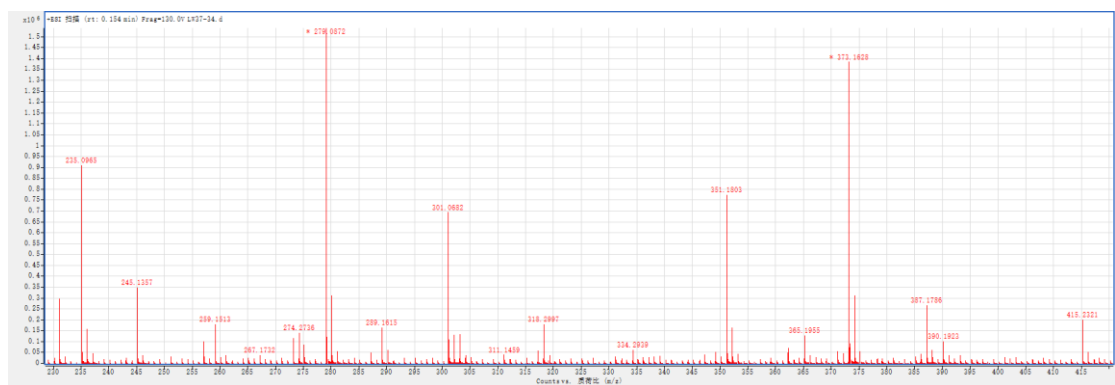


Figure S23. HRESIMS spectrum of alternolide B (2)

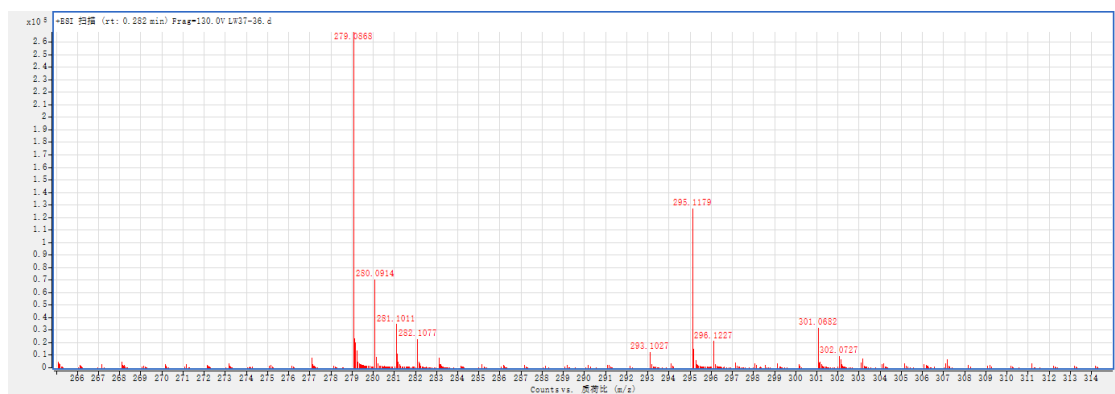


Figure S24. HRESIMS spectrum of alternolide C (3)

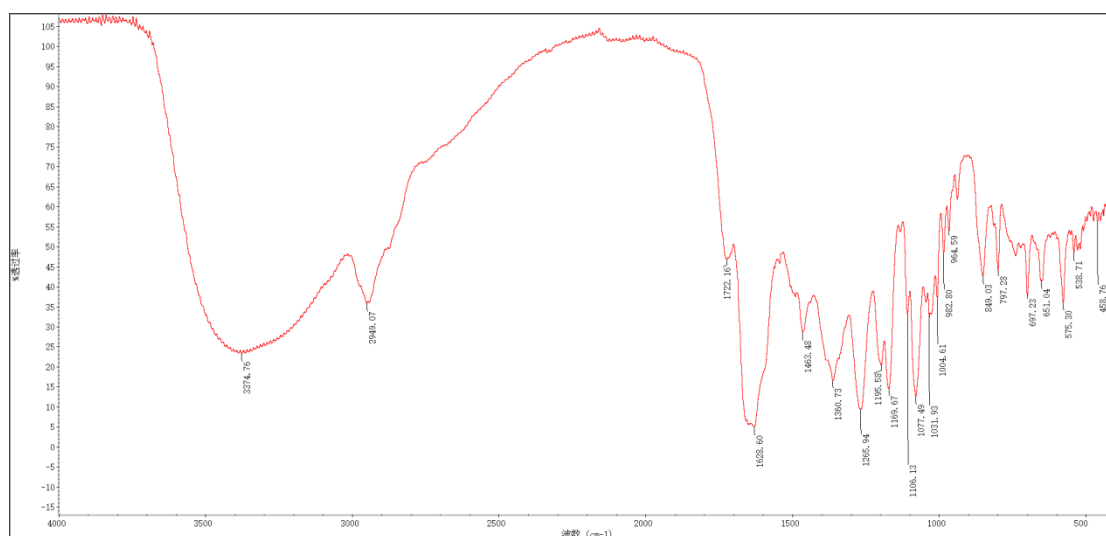


Figure S25. Infrared spectrum of alternolide A (1)

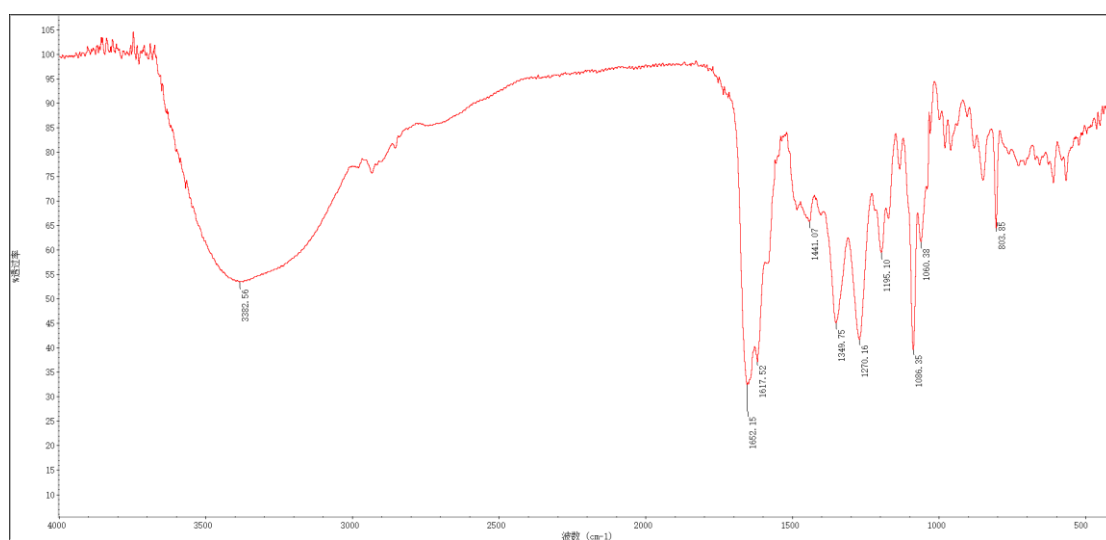


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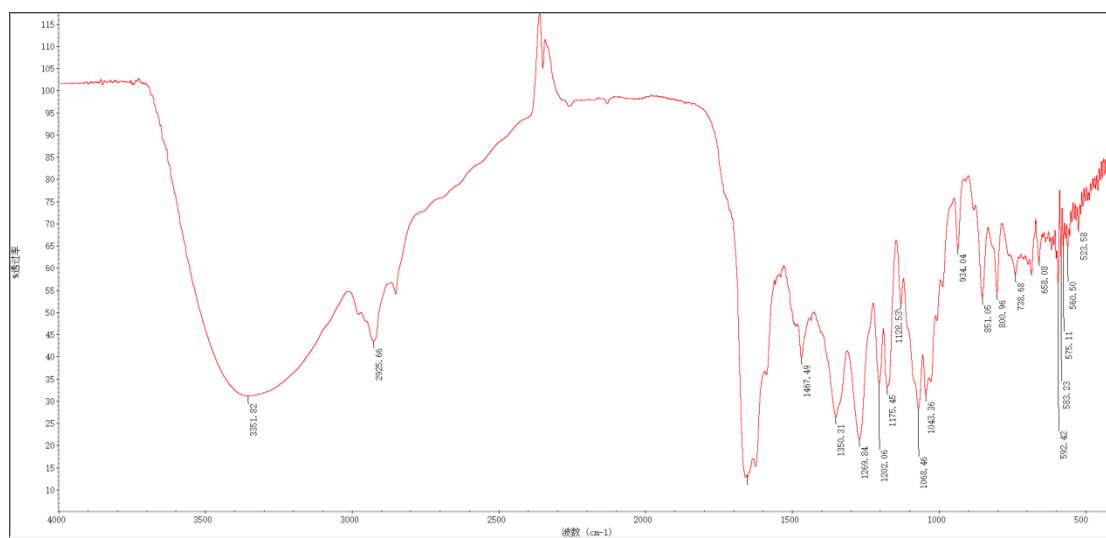


Figure S27. Infrared spectrum of alternolide C (3)

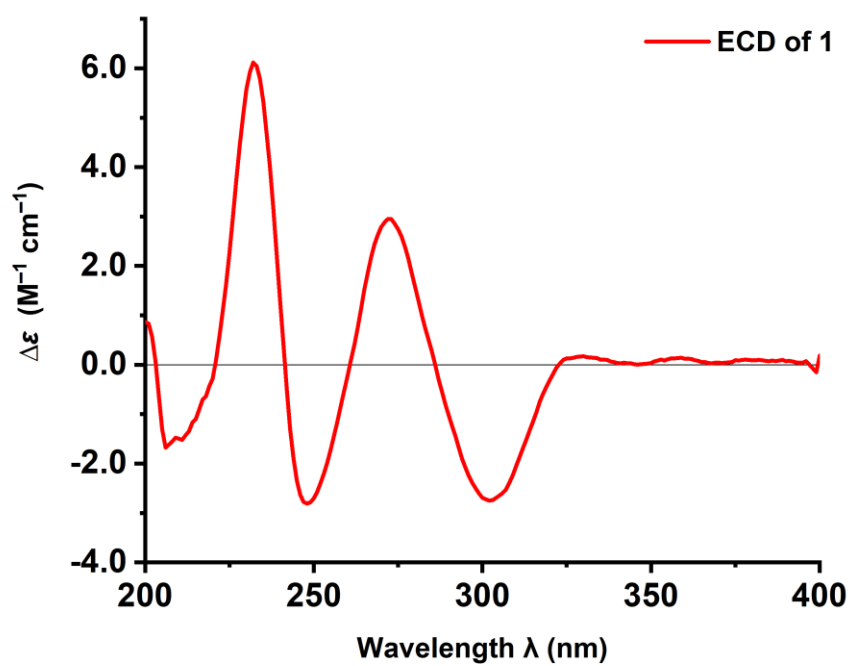


Figure S28. ECD spectrum of alternolide A (1)

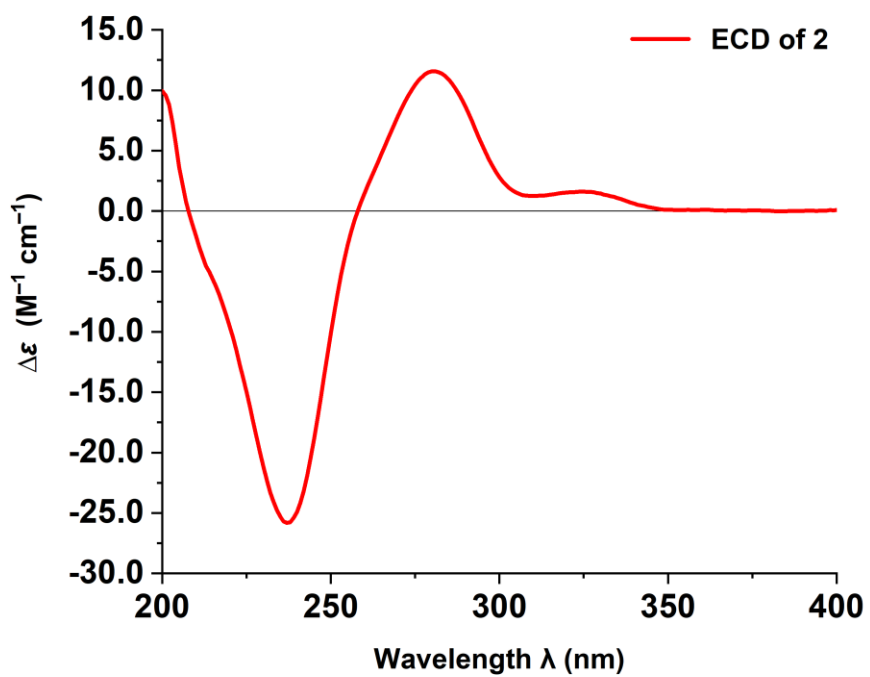


Figure S29. ECD spectrum of alternolide B (2)

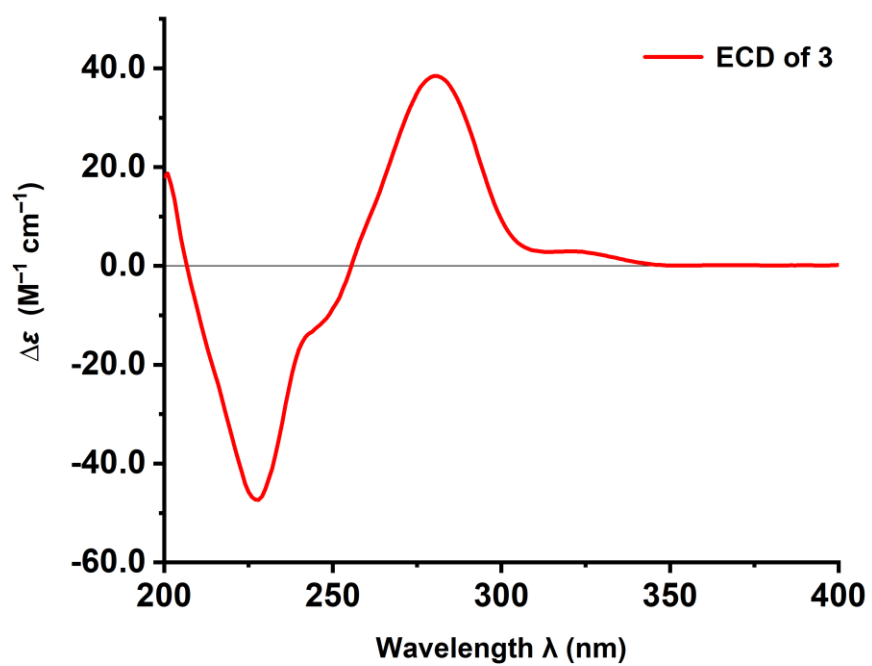


Figure S30. ECD spectrum of alternolide C (3)

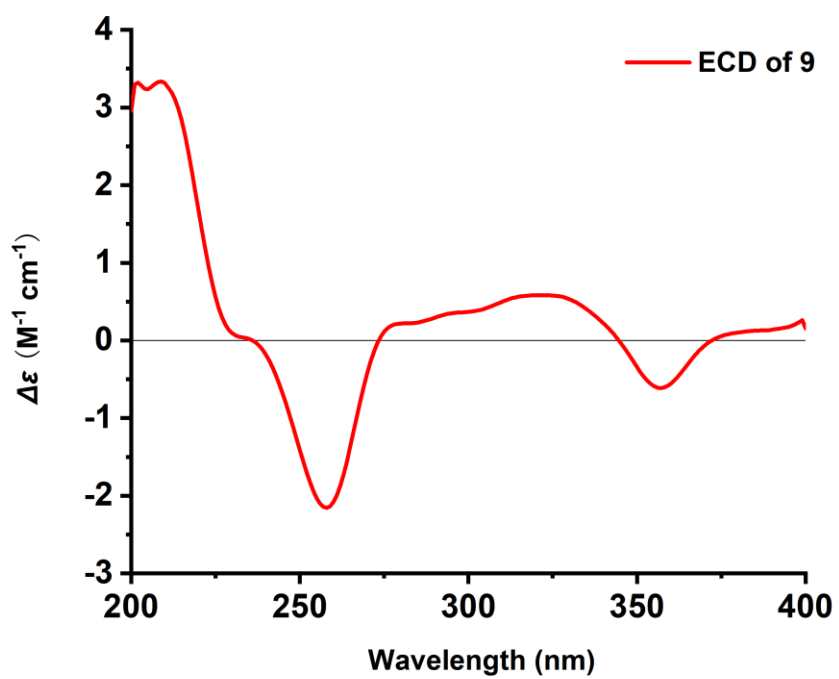
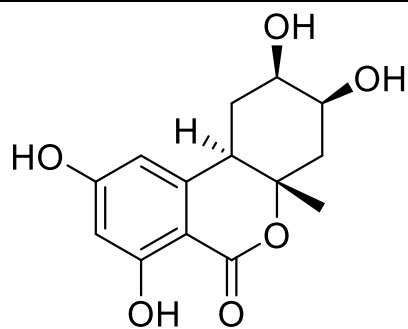
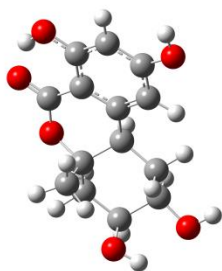


Figure S31. ECD spectrum of 1-deoxyrubralactone (9)

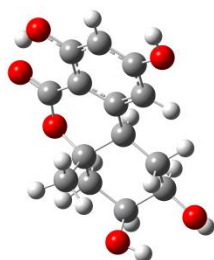


Conformers

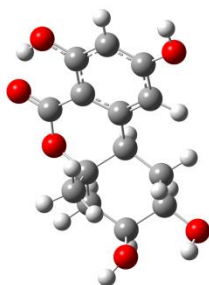
Populations



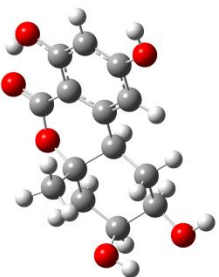
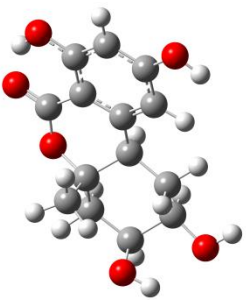
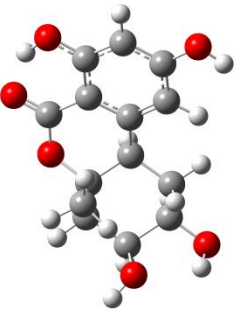
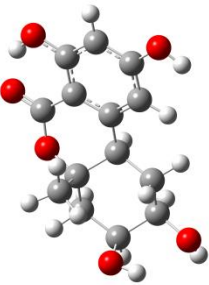
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19.31%



14.47%

	23.48%
	4.17%
	4.99%
	5.50%

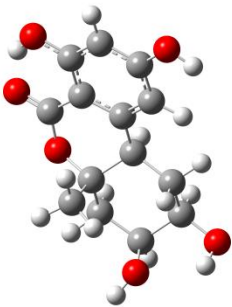
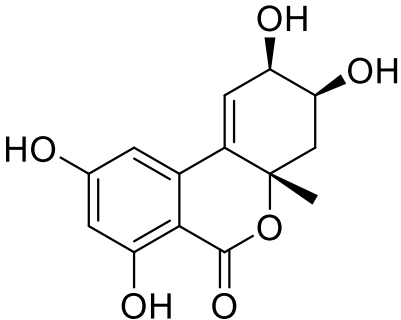
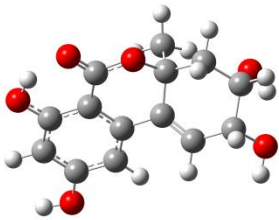
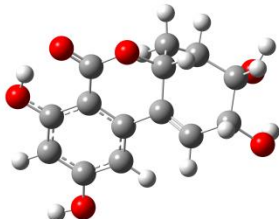
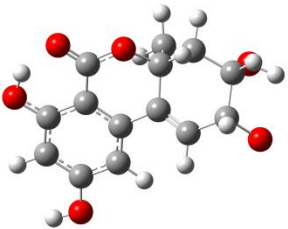
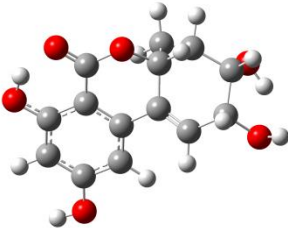
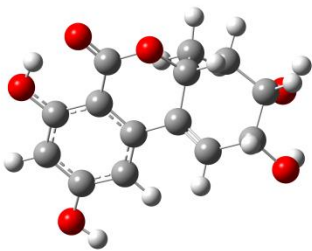
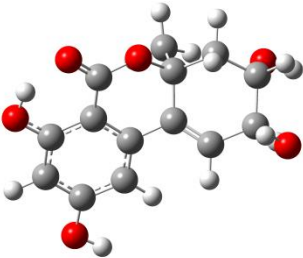
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Figure S32. ECD conformers of alternolide A (**1**)

	
Conformers	Populations
	<p>12.38%</p>
	<p>22.21%</p>

	<p>13.70%</p>
	<p>25.30%</p>
	<p>9.38%</p>
	<p>4.14%</p>

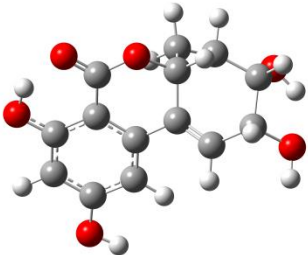
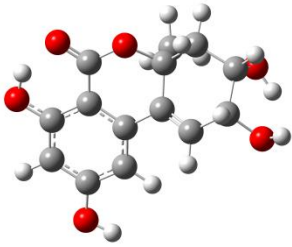
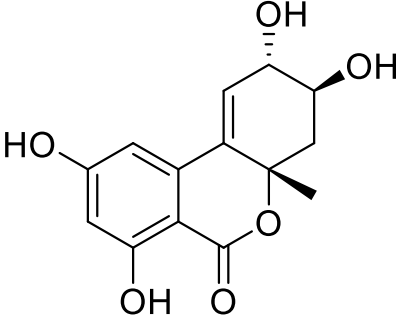
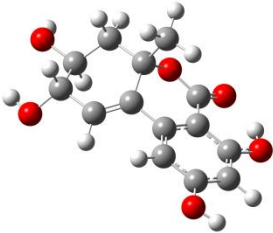
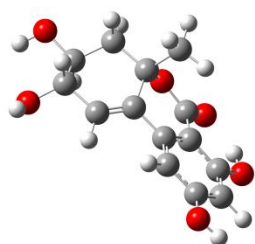
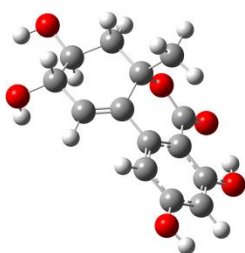
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	<p>9.81%</p>

Figure S33. ECD conformers of alternolide B (2)

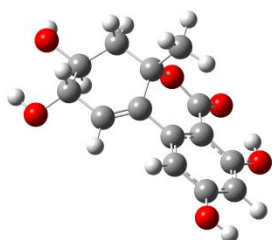
	
Conformers	Populations
	<p>20.44%</p>



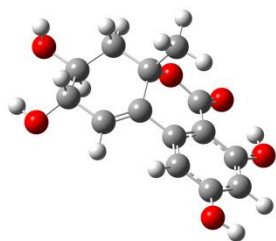
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24.00%



20.11%



4.73%

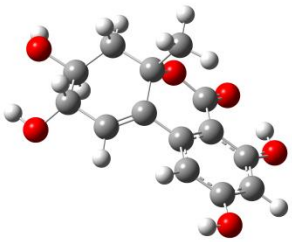
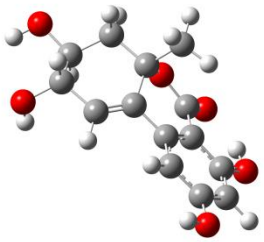
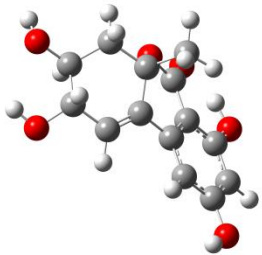
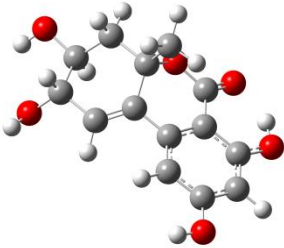
	8.02%
	7.48%
	7.90%
	14.6%

Figure S34. ECD conformers of alternolide C (**3**)

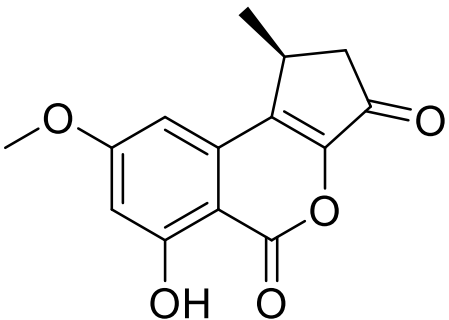
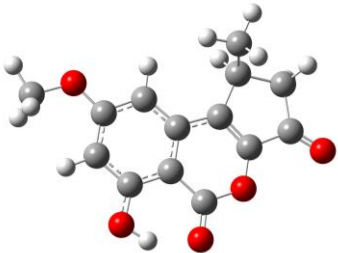
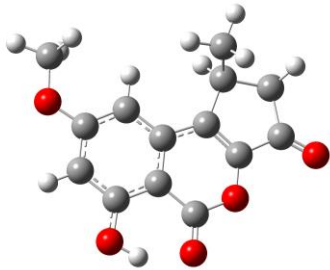
	
Conformers	Populations
	84.72%
	15.28%

Figure S35. ECD conformers of 1-deoxyrubralactone (**9**)