

Supporting Information

Lipid-lowering Polyketides from the Fungus *Penicillium steckii* HDN13-279

**Gui-Hong Yu,^{1,†} Shuai Wang,^{2,†} Lu Wang,¹ Qian Che,¹ Tian-Jiao, Zhu,¹ Guo-Jian Zhang,^{1,3}
Qian-Qun Gu,¹ Peng Guo^{2,*} and De-Hai Li^{1,3,*}**

¹ Key Laboratory of Marine Drugs, Chinese Ministry of Education, School of Medicine and Pharmacy, Ocean University of China, Qingdao 266003, P. R. China; Yuguihong1990@126.com (G.-H. Y.); 784940819@qq.com (L. W.); cheqian064@ouc.edu.cn (Q. C.); zhutj@ouc.edu.cn (T.-J. Z); guqianq@ouc.edu.cn (Q.-Q. G.)

² Institute of Medicinal Plant Development, Chinese Academy of Medical Sciences & Peking Union Medical College, Beijing 100193, P. R. China; zhuizhirun@163.com (S. W.)

³ Laboratory for Marine Drugs and Bioproducts of Qingdao National Laboratory for Marine Science and Technology, Qingdao, 266237, P. R. China; 95327787@qq.com (G.-J. Z.)

* Correspondence; E-mail: dehaili@ouc.edu.cn (D.-H. L.) and pguo@implad.ac.cn (P. G.). Tel.: 0086-532-82032066 (D.-H. L.).

[†] G.-H. Y. and S. W. contributed equally.

List of Supporting Information

Figure S1. ^1H NMR Spectrum (500 MHz) of tanzawaic acid R (1) in Methanol- d_4	S4
Figure S2. ^{13}C NMR Spectrum (125 MHz) of tanzawaic acid R (1) in Methanol- d_4	S4
Figure S3. HMQC Spectrum of tanzawaic acid R (1).....	S5
Figure S4. COSY Spectrum of tanzawaic acid R (1).....	S5
Figure S5. HMBC Spectrum of tanzawaic acid R (1)	S6
Figure S6. NOESY Spectrum of tanzawaic acid R (1)	S6
Figure S7. HRESIMS Spectrum of tanzawaic acid R (1)	S7
Figure S8. ^1H NMR Spectrum (500 MHz) of tanzawaic acid S (2) in Methanol- d_4	S7
Figure S9. ^{13}C NMR Spectrum (125 MHz) of tanzawaic acid S (2) in Methanol- d_4	S8
Figure S10. HMQC Spectrum of tanzawaic acid S (2).....	S8
Figure S11. COSY Spectrum of tanzawaic acid S (2).....	S9
Figure S12. HMBC Spectrum of tanzawaic acid S (2).....	S9
Figure S13. NOESY Spectrum of tanzawaic acid S (2).....	S10
Figure S14. HRESIMS Spectrum of tanzawaic acid S (2).....	S10
Figure S15. ^1H NMR Spectrum (500 MHz) of tanzawaic acid T (3) in CDCl_3	S11
Figure S16. ^{13}C NMR Spectrum (125 MHz) of tanzawaic acid T (3) in CDCl_3	S11
Figure S17. HMQC Spectrum of tanzawaic acid T (3).....	S12
Figure S18. COSY Spectrum of tanzawaic acid T (3).....	S12
Figure S19. HMBC Spectrum of tanzawaic acid T (3).....	S13
Figure S20. NOESY Spectrum of tanzawaic acid T (3)	S13
Figure S21. HRESIMS Spectrum of tanzawaic acid T (3)	S14
Figure S22. ^1H NMR Spectrum (500 MHz) of tanzawaic acid U (4) in CDCl_3	S14
Figure S23. ^{13}C NMR Spectrum (125 MHz) of tanzawaic acid U (4) in CDCl_3	S15
Figure S24. HMQC Spectrum of tanzawaic acid U (4)	S15
Figure S25. COSY Spectrum of tanzawaic acid U (4)	S16
Figure S26. HMBC Spectrum of tanzawaic acid U (4)	S16
Figure S27. NOESY Spectrum of tanzawaic acid U (4)	S17
Figure S28. HRESIMS Spectrum of tanzawaic acid U (4)	S17
Figure S29. ^1H NMR Spectrum (500 MHz) of tanzawaic acid V (5) in Methanol- d_4	S18
Figure S30. ^{13}C NMR Spectrum (125 MHz) of tanzawaic acid V (5) in Methanol- d_4	S18
Figure S31. HMQC Spectrum of tanzawaic acid V (5)	S19
Figure S32. COSY Spectrum of tanzawaic acid V (5)	S19
Figure S33. HMBC Spectrum of tanzawaic acid V (5)	S20
Figure S34. NOESY Spectrum of tanzawaic acid V (5)	S20
Figure S35. HRESIMS Spectrum of tanzawaic acid V (5)	S21
Figure S36. ^1H NMR Spectrum (500 MHz) of tanzawaic acid W (6) in CDCl_3	S21
Figure S37. ^{13}C NMR Spectrum (125 MHz) of tanzawaic acid W (6) in CDCl_3	S22
Figure S38. HMQC Spectrum of tanzawaic acid W (6).....	S22
Figure S39. COSY Spectrum of tanzawaic acid W (6)	S23
Figure S40. HMBC Spectrum of tanzawaic acid W (6).....	S23
Figure S41. NOESY Spectrum of tanzawaic acid W (6).....	S24
Figure S42. HRESIMS Spectrum of tanzawaic acid W (6)	S24
Figure S43. ^1H NMR Spectrum (500 MHz) of tanzawaic acid X (11) in CDCl_3	S25

Figure S44. ^{13}C NMR Spectrum (125 MHz) of tanzawaic acid X (11) in CDCl_3	S25
Figure S45. HMQC Spectrum of tanzawaic acid X (11).....	S26
Figure S46. COSY Spectrum of tanzawaic acid X (11).....	S26
Figure S47. HMBC Spectrum of tanzawaic acid X (11).....	S27
Figure S48. NOESY Spectrum of tanzawaic acid X (11).....	S27
Figure S49. HRESIMS Spectrum of tanzawaic acid X (11)	S28
Figure S50. ^1H NMR Spectrum (500 MHz) of 1a in Methanol- d_4	S28
Figure S51. ^1H NMR Spectrum (500 MHz) of 1b in Methanol- d_4	S29
Figure S52. ^{13}C NMR Spectrum (125 MHz) of 1b in Methanol- d_4	S29
Figure S53. ^1H NMR Spectrum (500 MHz) of 12a in CDCl_3	S30
Figure S54. ^{13}C NMR Spectrum (125 MHz) of 12a in CDCl_3	S30
Figure S55. IR spectrum of tanzawaic acid R (1).....	S31
Figure S56. IR spectrum of tanzawaic acid S (2).....	S31
Figure S57. IR spectrum of tanzawaic acid T (3).....	S31
Figure S58. IR spectrum of tanzawaic acid U (4).....	S32
Figure S59. IR spectrum of tanzawaic acid V (5).....	S32
Figure S60. IR spectrum of tanzawaic acid W (6).....	S32
Figure S61. IR spectrum of tanzawaic acid X (11).....	S33

Figure S1. ^1H NMR Spectrum (500 MHz) of tanzawaic acid R (**1**) in Methanol- d_4

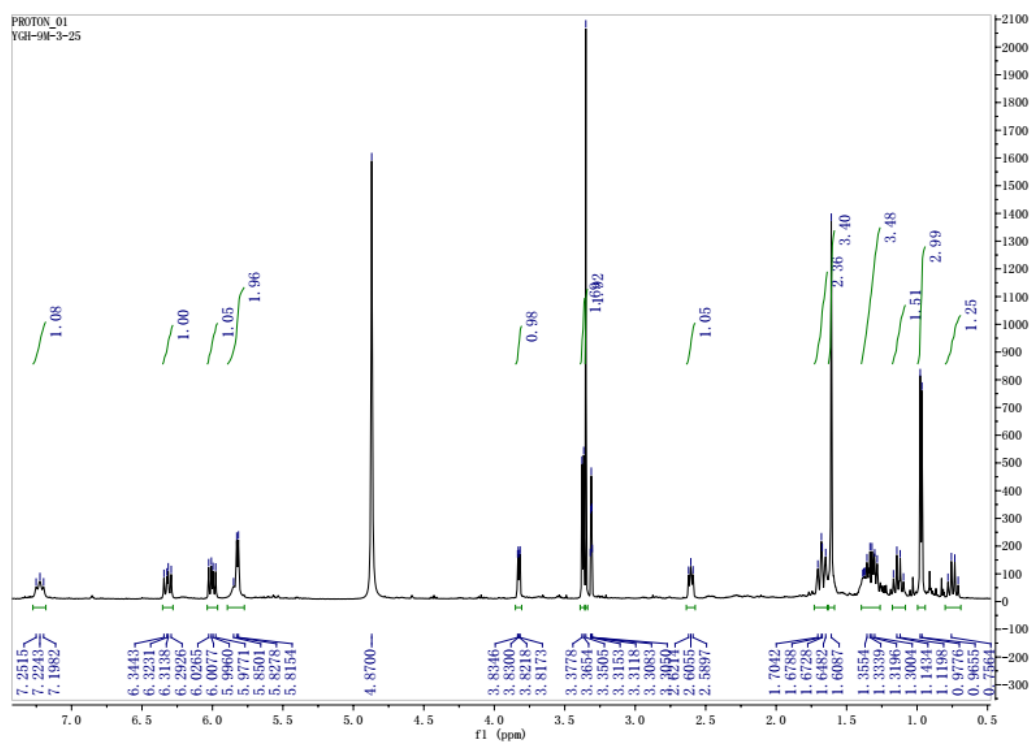


Figure S2. ^{13}C NMR Spectrum (125 MHz) of tanzawaic acid R (**1**) in Methanol- d_4

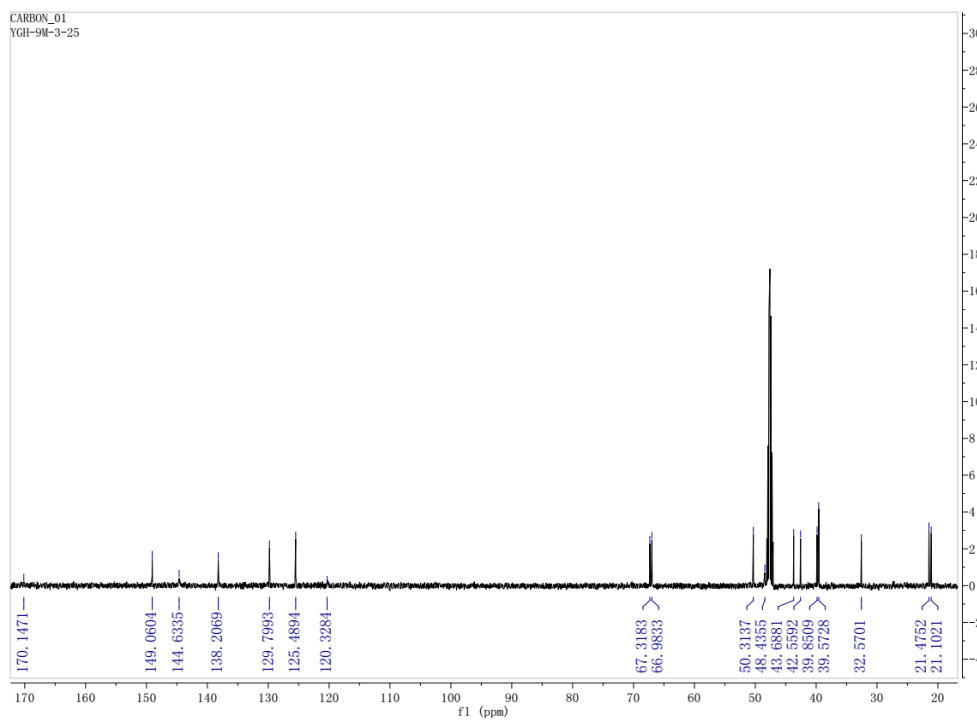


Figure S3. HMQC Spectrum of tanzawaic acid R (1)

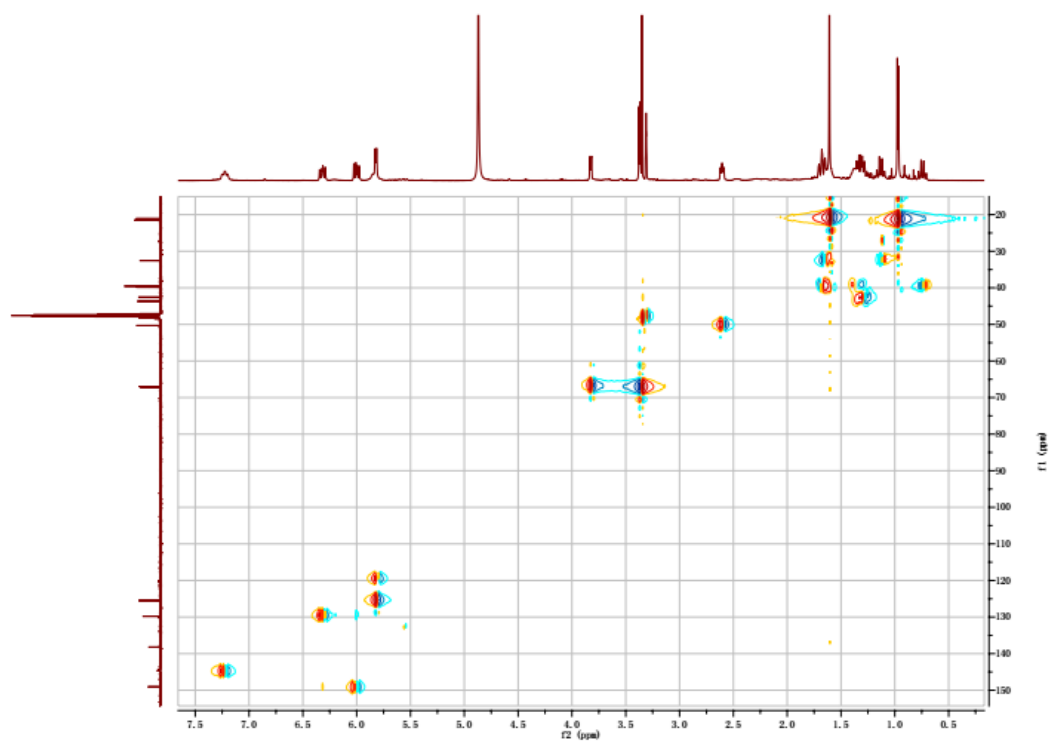


Figure S4. COSY Spectrum of tanzawaic acid R (1)

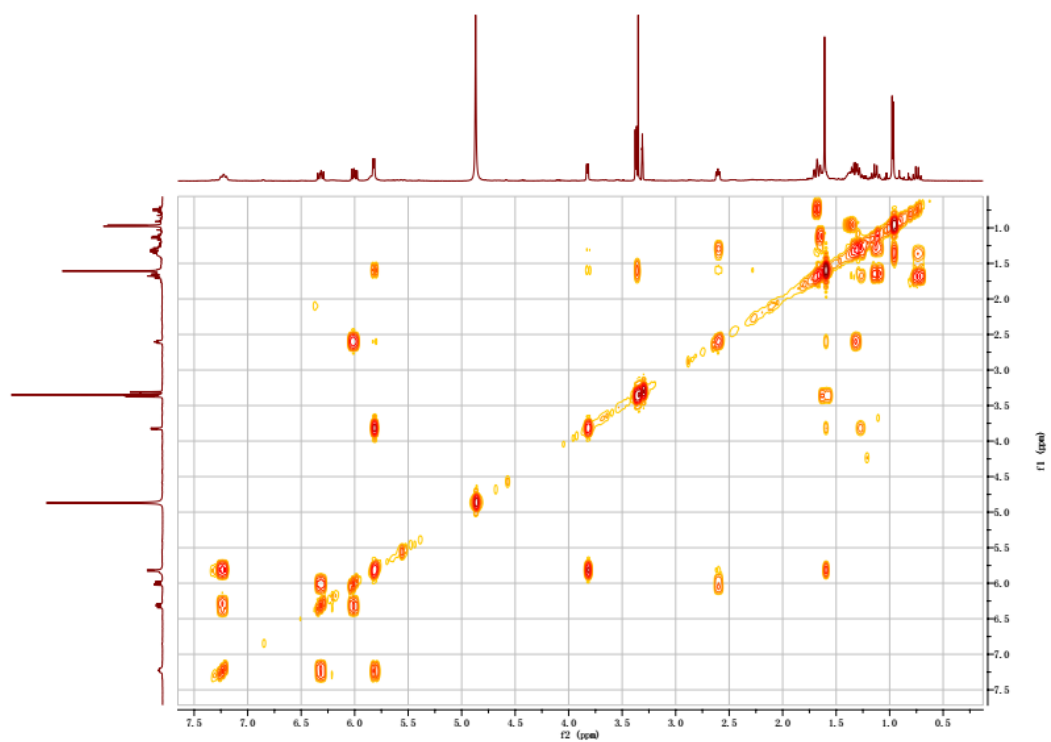


Figure S5. HMBC Spectrum of tanzawaic acid R (**1**)

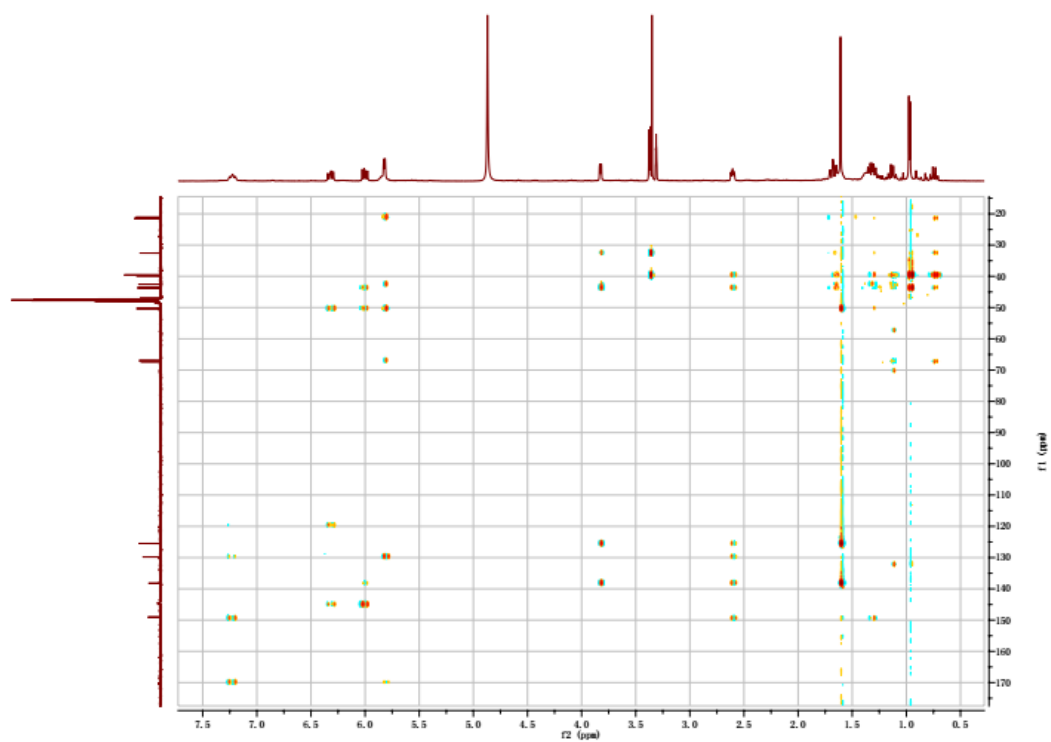


Figure S6. NOESY Spectrum of tanzawaic acid R (**1**)

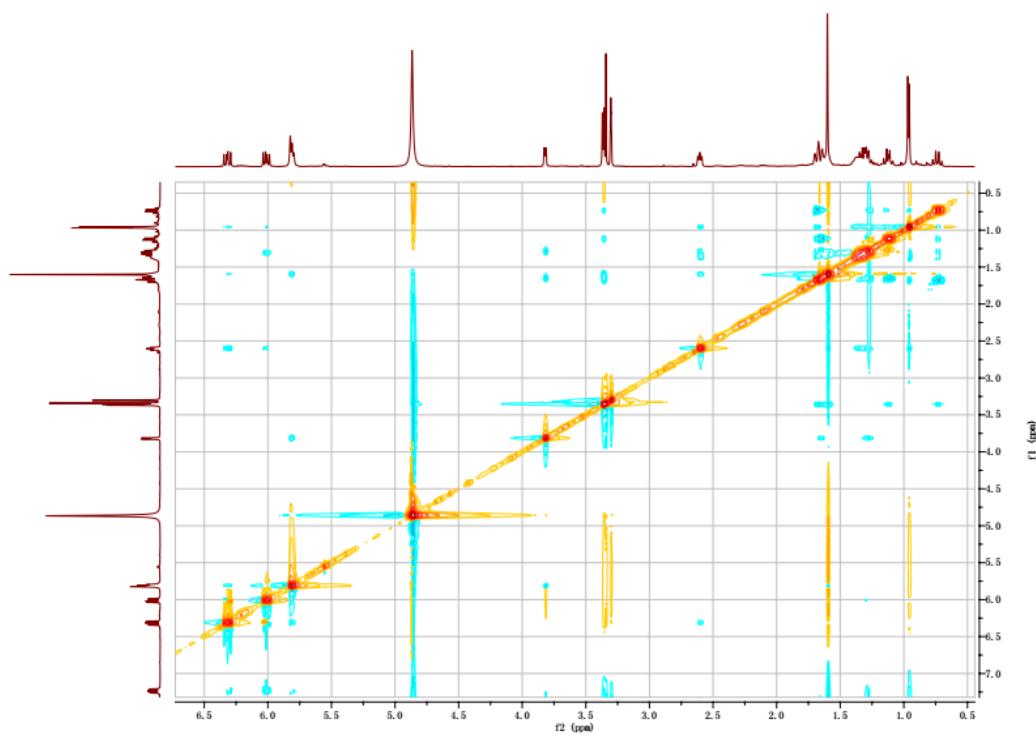


Figure S7. HRESIMS Spectrum of tanzawaic acid R (1)

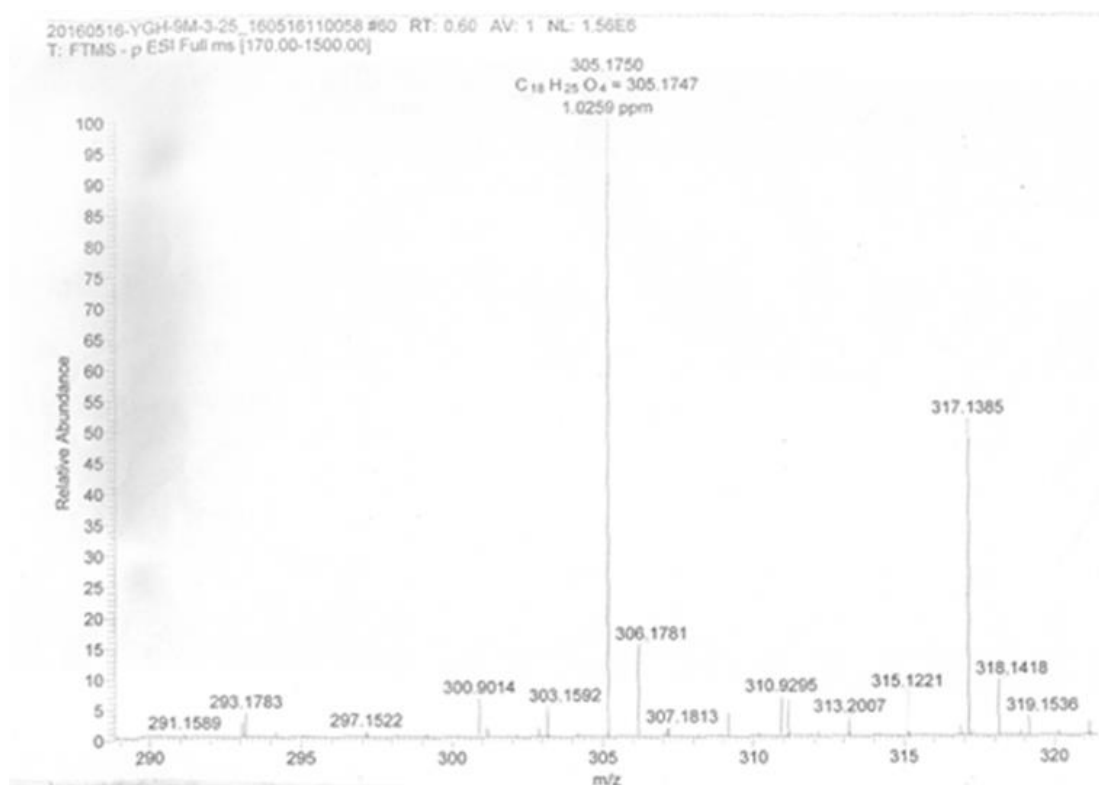


Figure S8. ¹H NMR Spectrum (500 MHz) of tanzawaic acid S (2) in Methanol-d₄

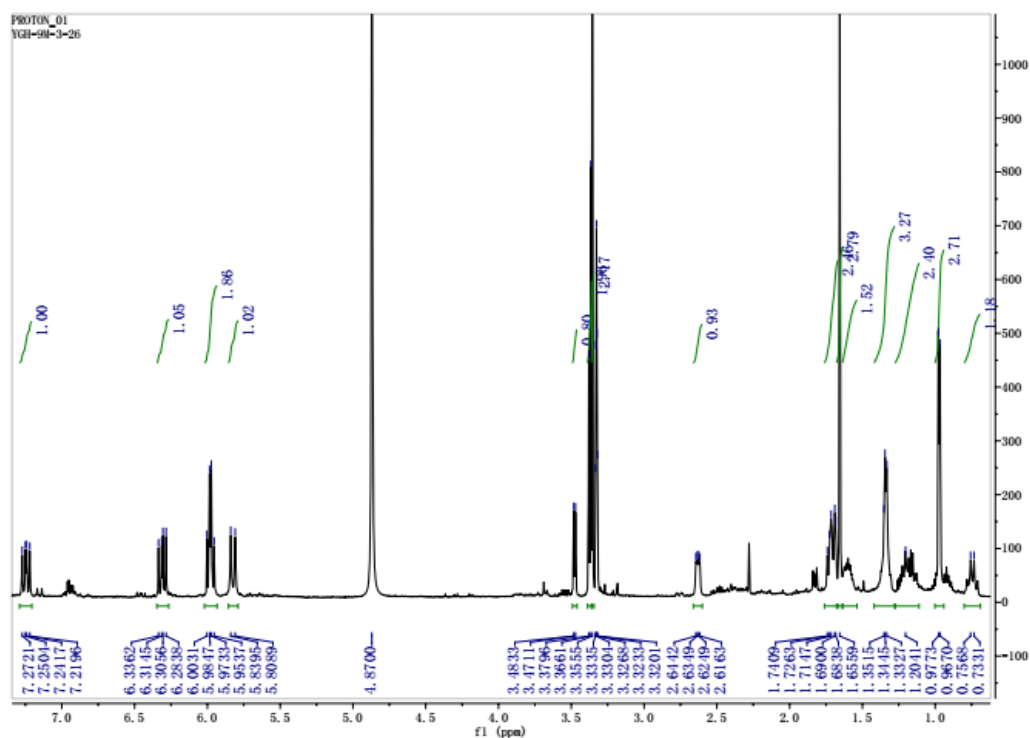


Figure S9. ^{13}C NMR Spectrum (125 MHz) of tanzawaic acid S (2) in Methanol- d_4

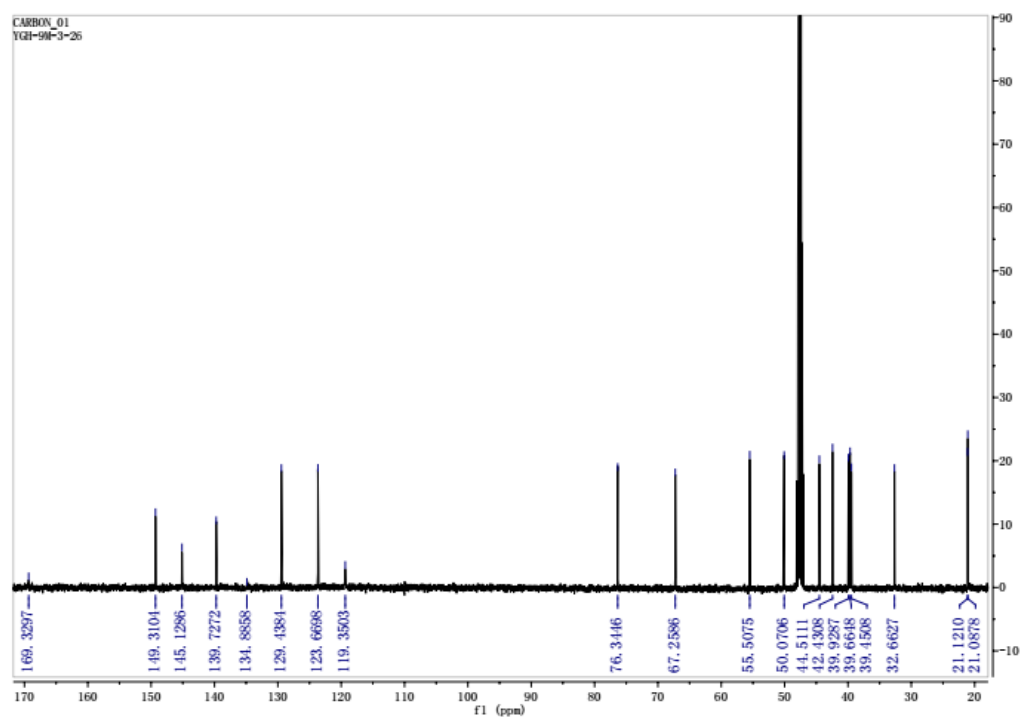


Figure S10. HMQC Spectrum of tanzawaic acid S (2)

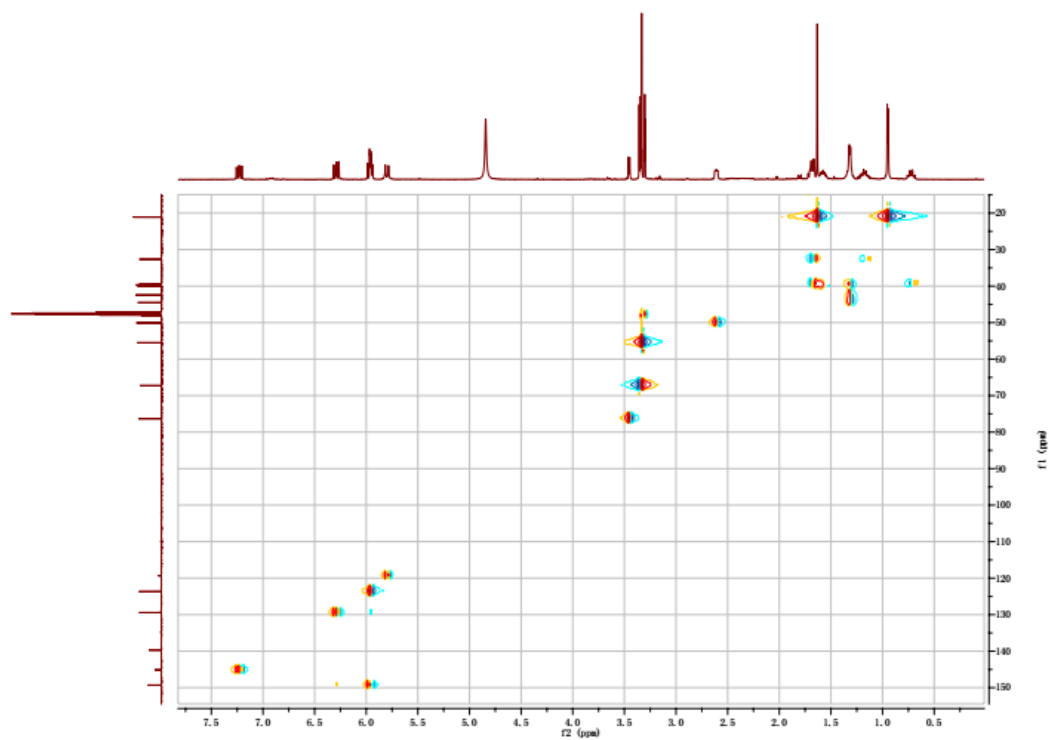


Figure S11. COSY Spectrum of tanzawaic acid S (2)

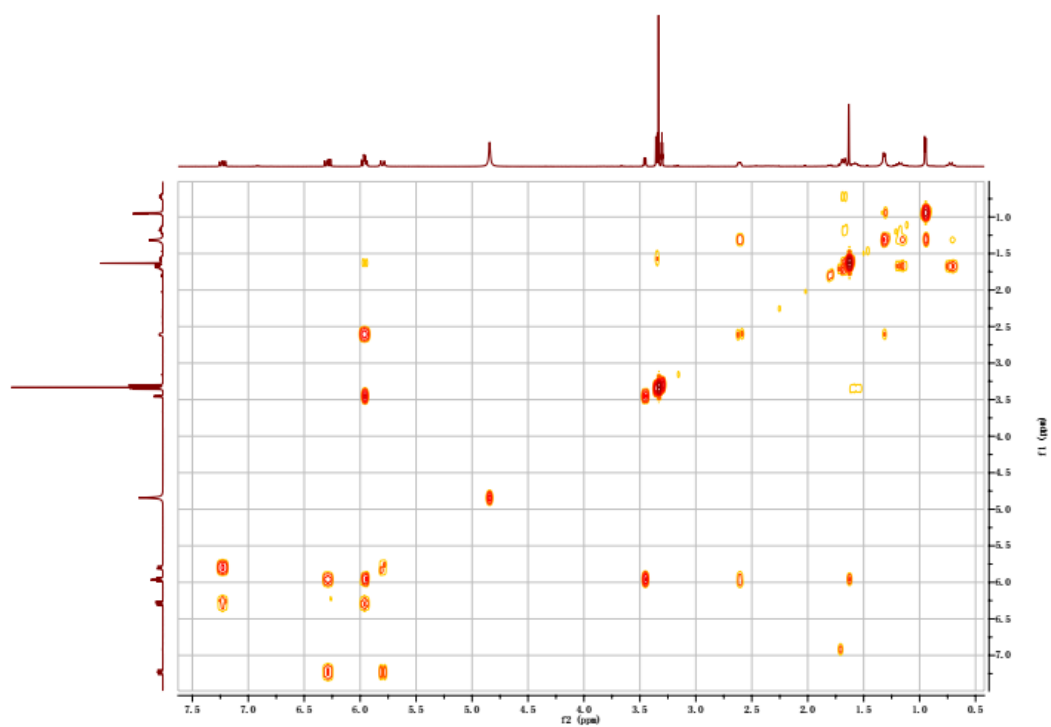


Figure S12. HMBC Spectrum of tanzawaic acid S (2)

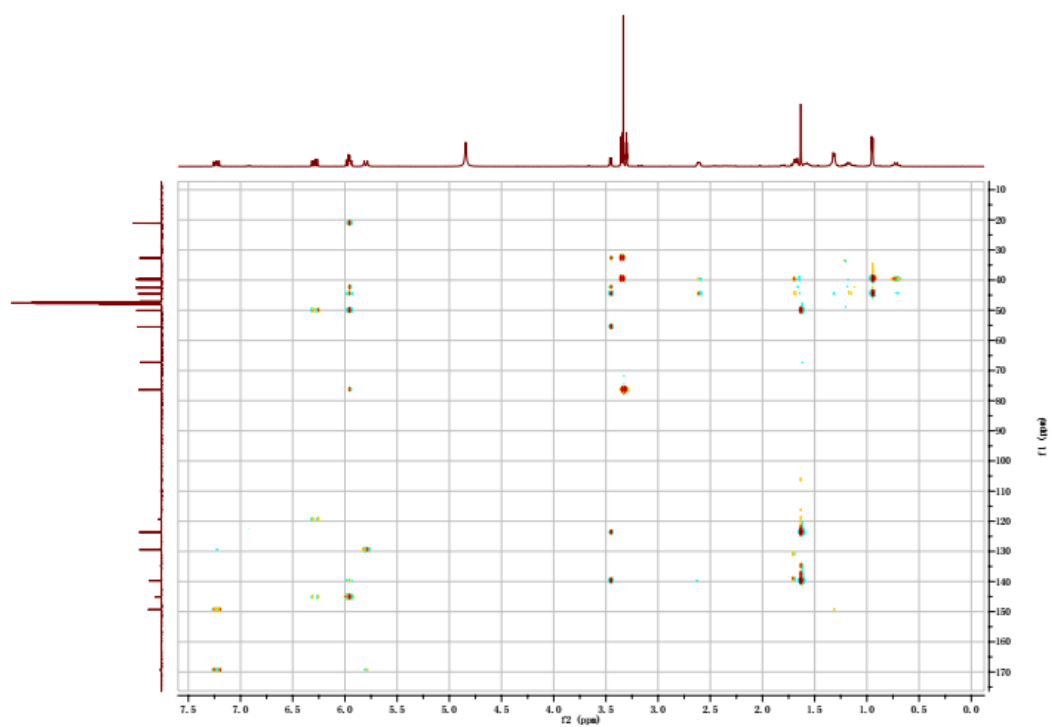


Figure S13. NOESY Spectrum of tanzawaic acid S (2)

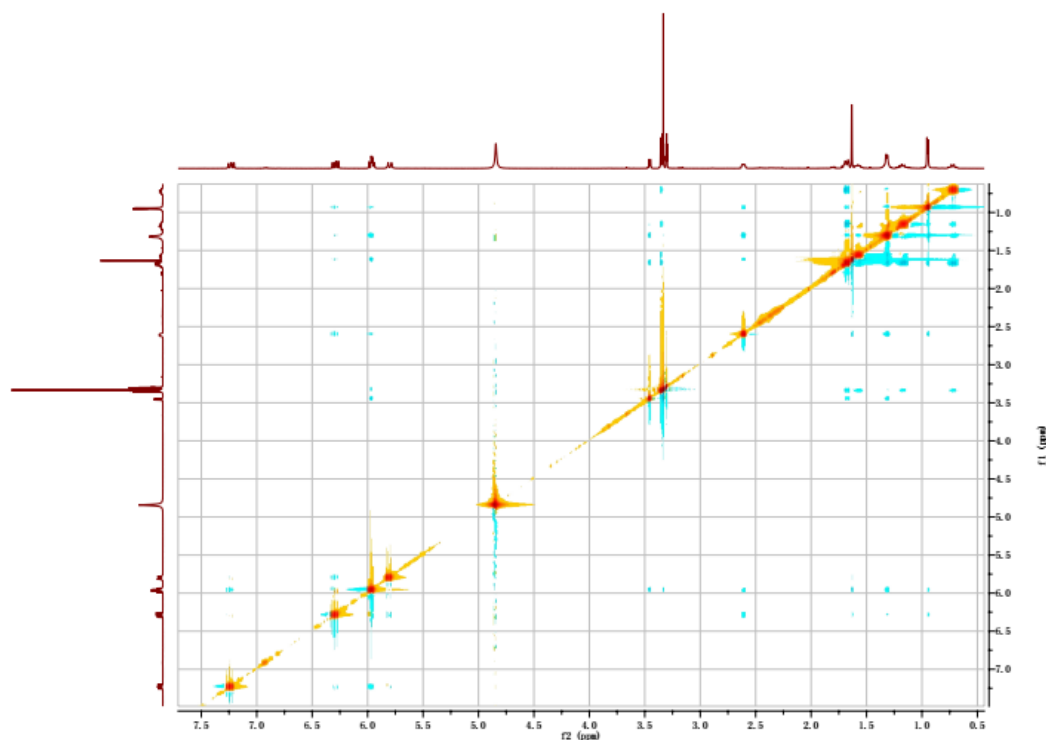


Figure S14. HRESIMS Spectrum of tanzawaic acid S (2)

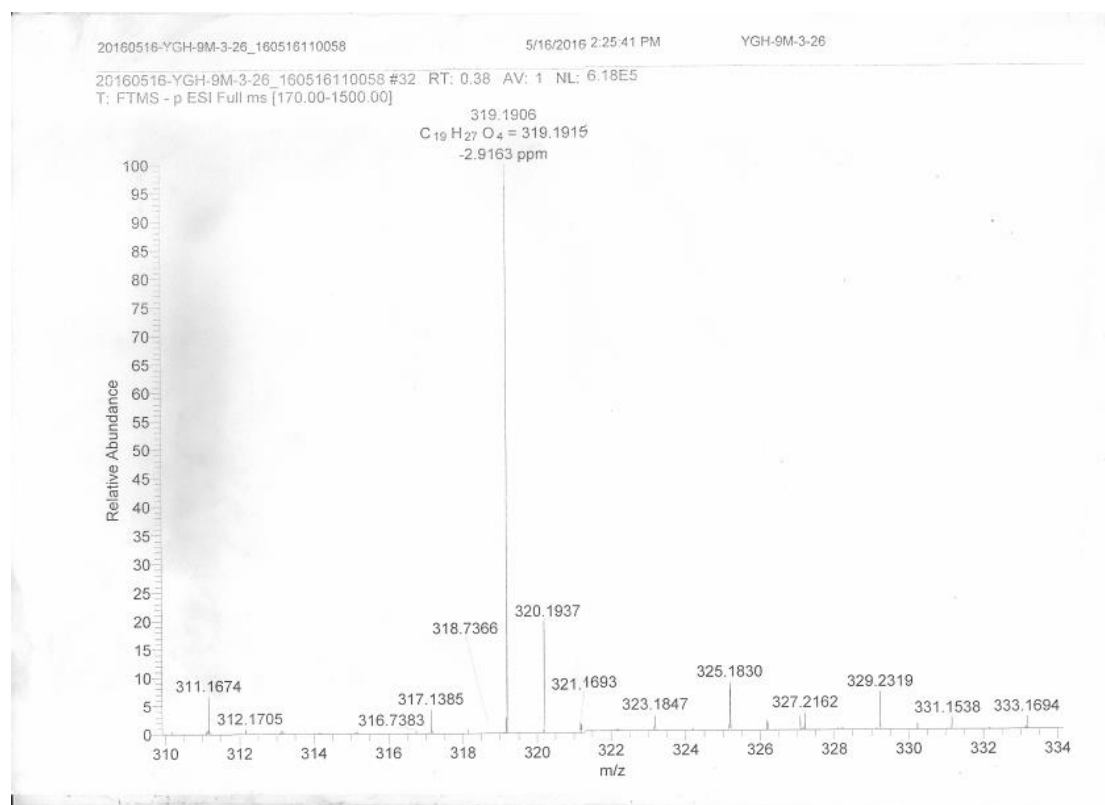


Figure S15. ^1H NMR Spectrum (500 MHz) of tanzawaic acid T (**3**) in CDCl_3

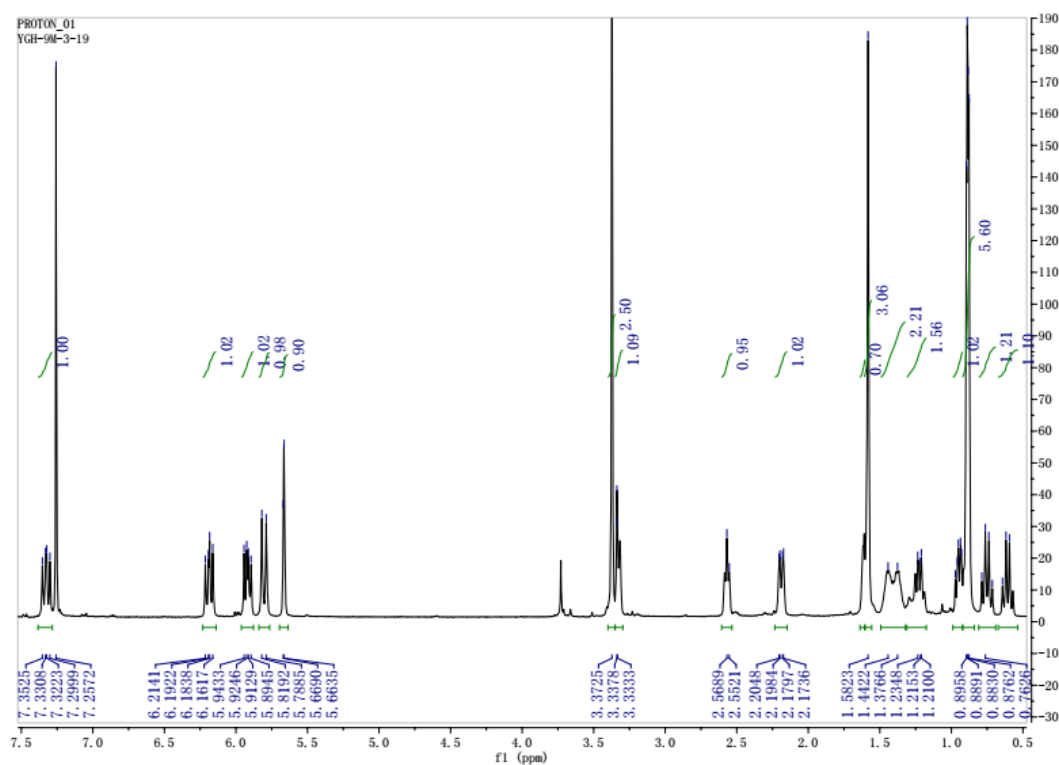


Figure S16. ^{13}C NMR Spectrum (125 MHz) of tanzawaic acid T (**3**) in CDCl_3

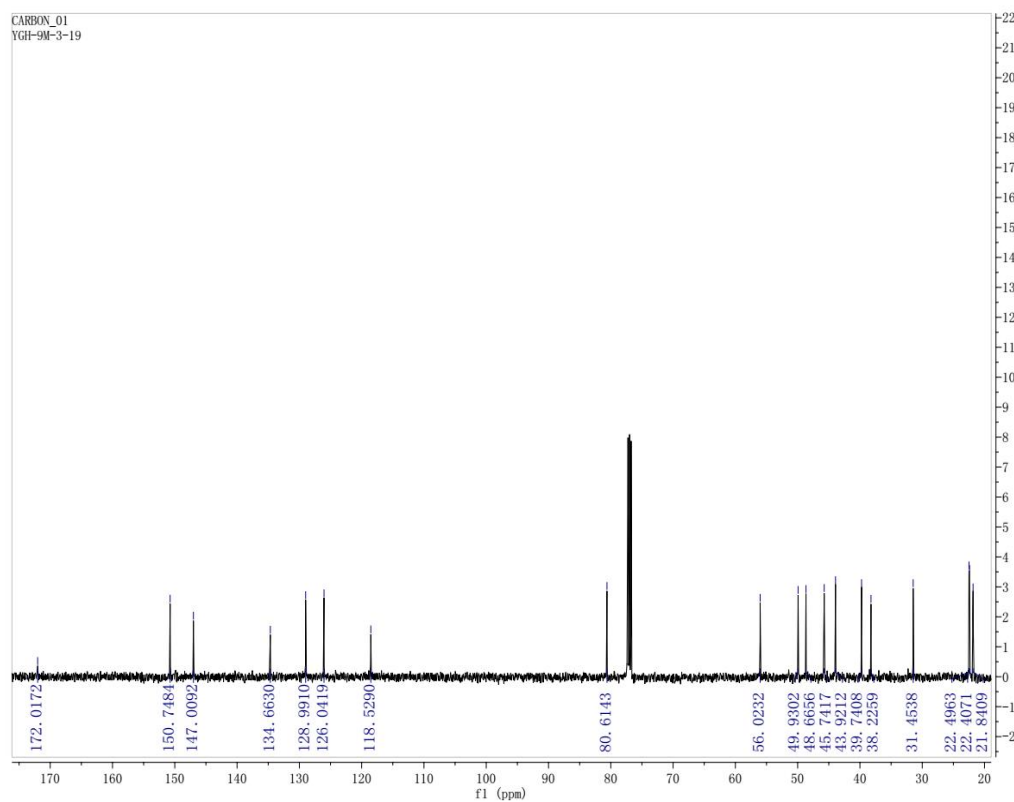


Figure S17. HMQC Spectrum of tanzawaic acid T (3)

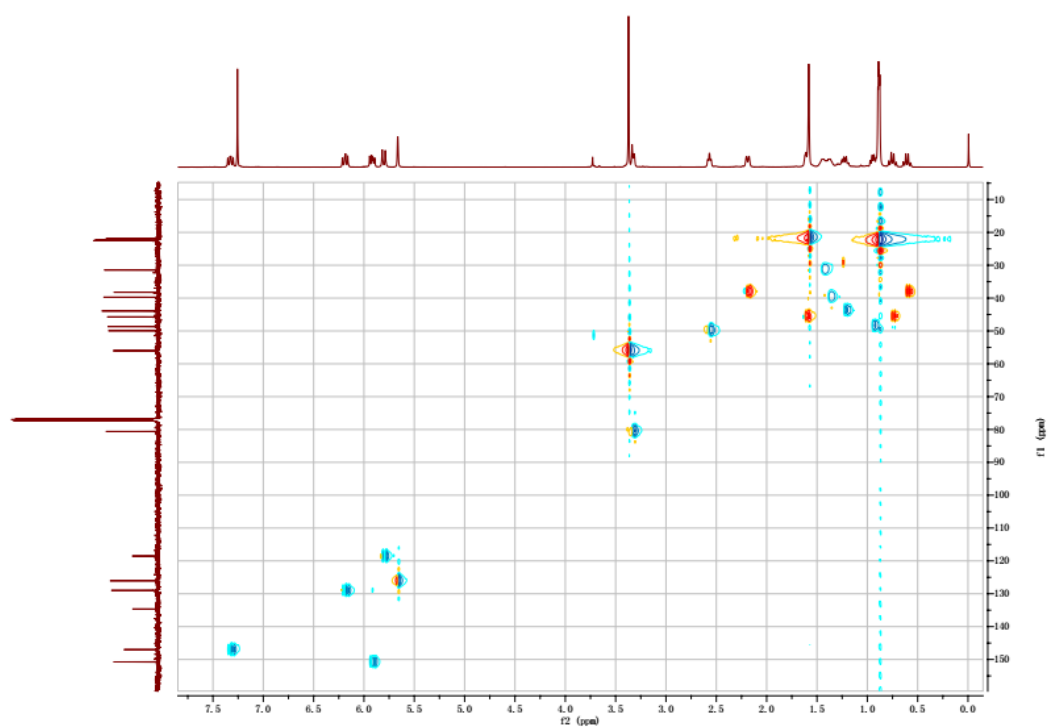


Figure S18. COSY Spectrum of tanzawaic acid T (3)

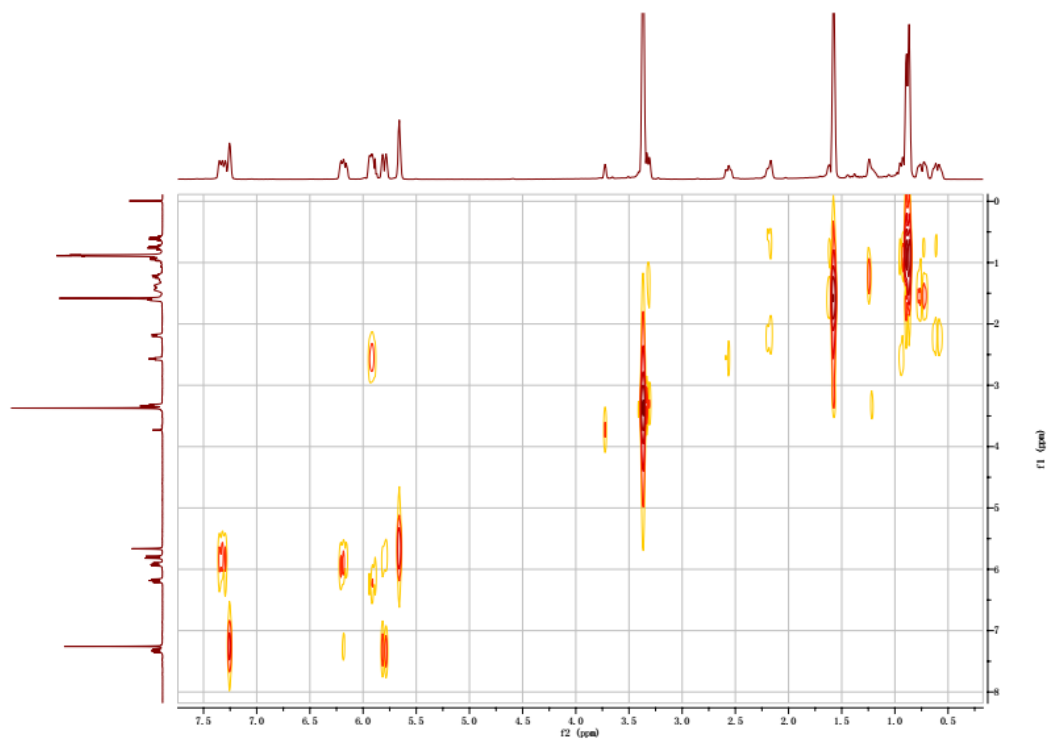


Figure S19. HMBC Spectrum of tanzawaic acid T (3)

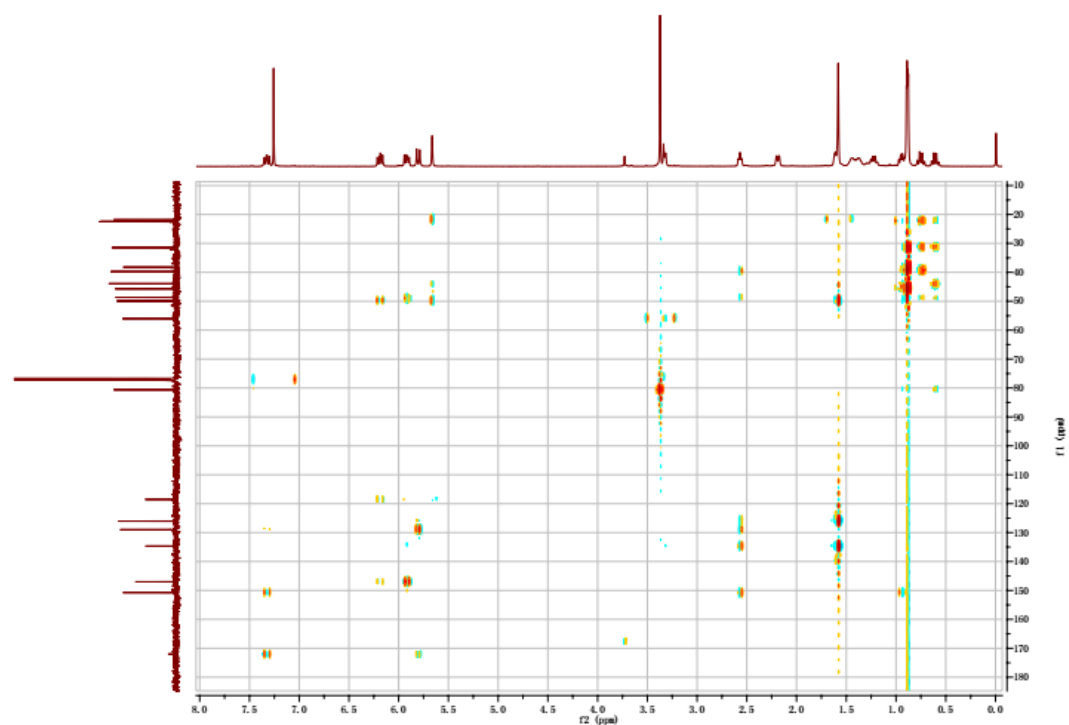


Figure S20. NOESY Spectrum of tanzawaic acid T (3)

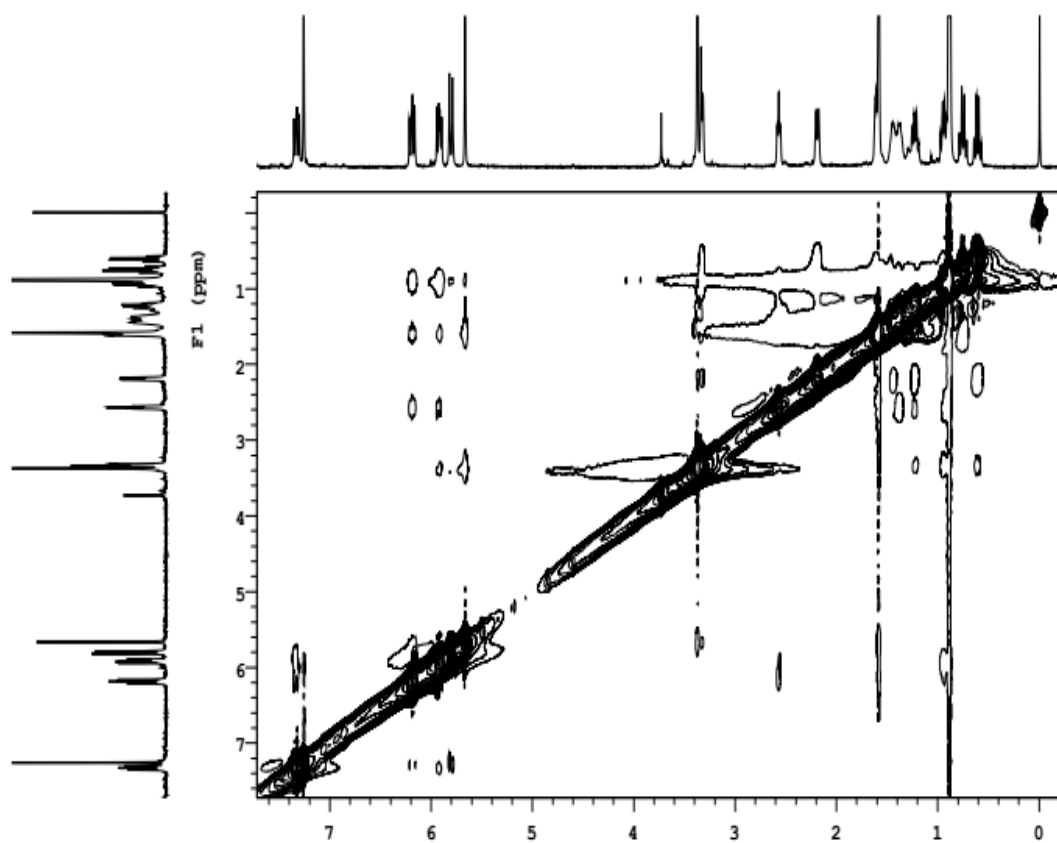


Figure S21. HRESIMS Spectrum of tanzawaic acid T (**3**)

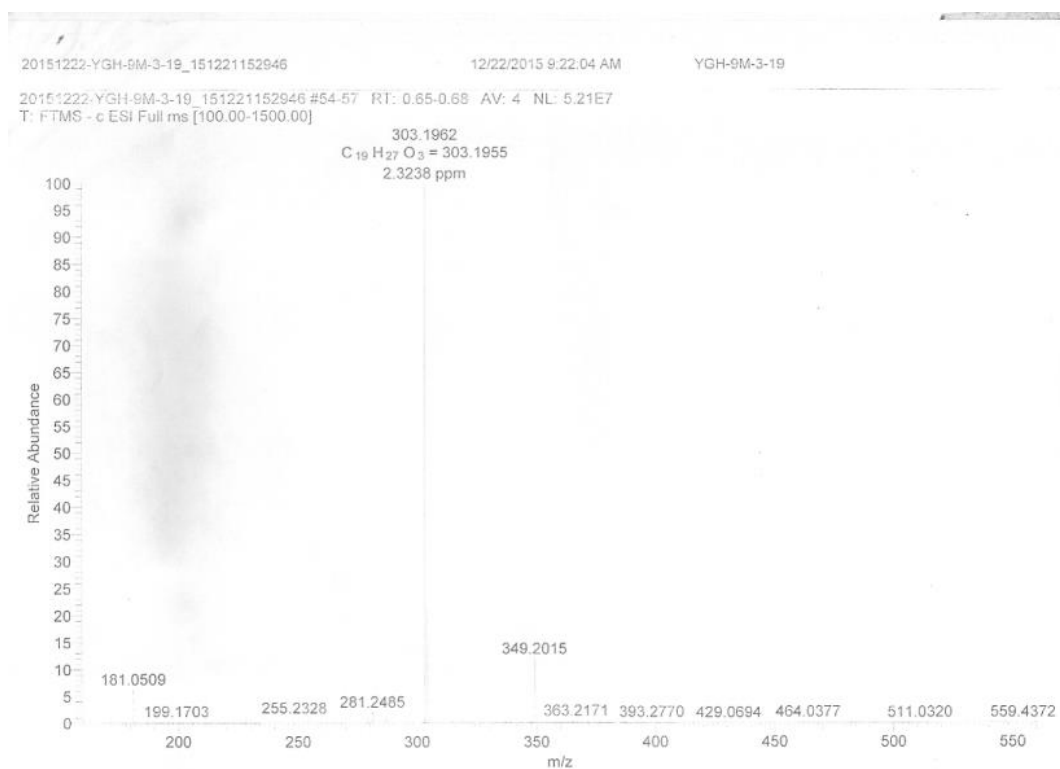


Figure S22. 1H NMR Spectrum (500 MHz) of tanzawaic acid U (**4**) in $CDCl_3$

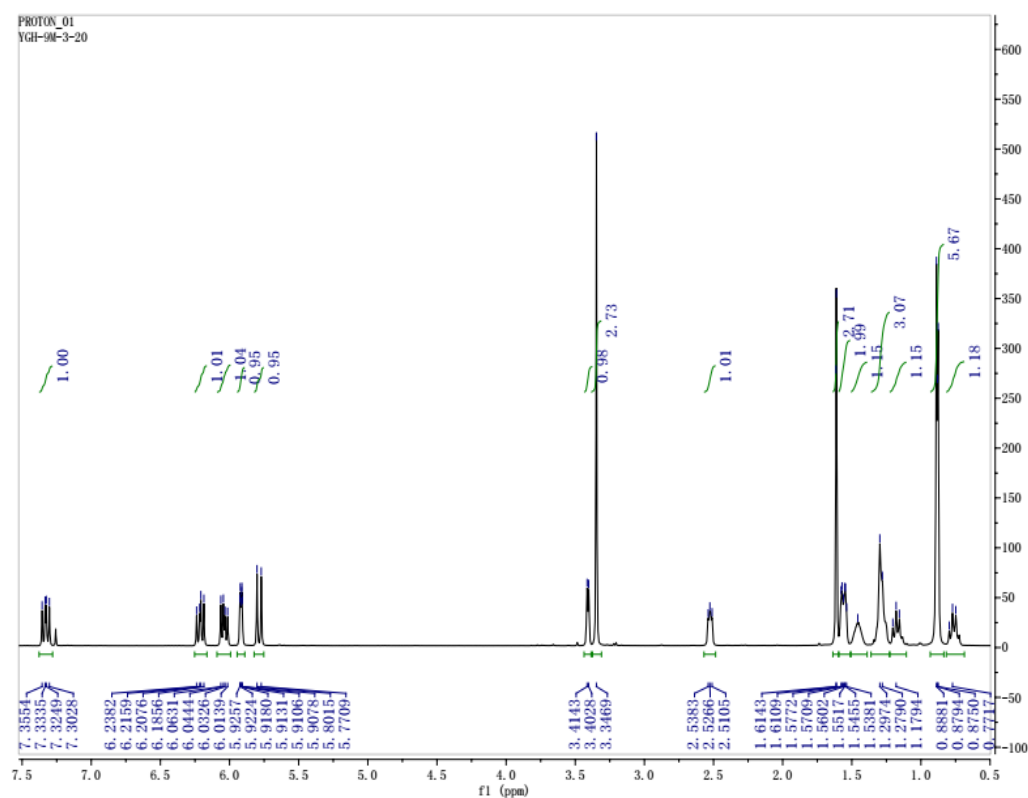


Figure S23. ^{13}C NMR Spectrum (125 MHz) of tanzawaic acid U (**4**) in CDCl_3

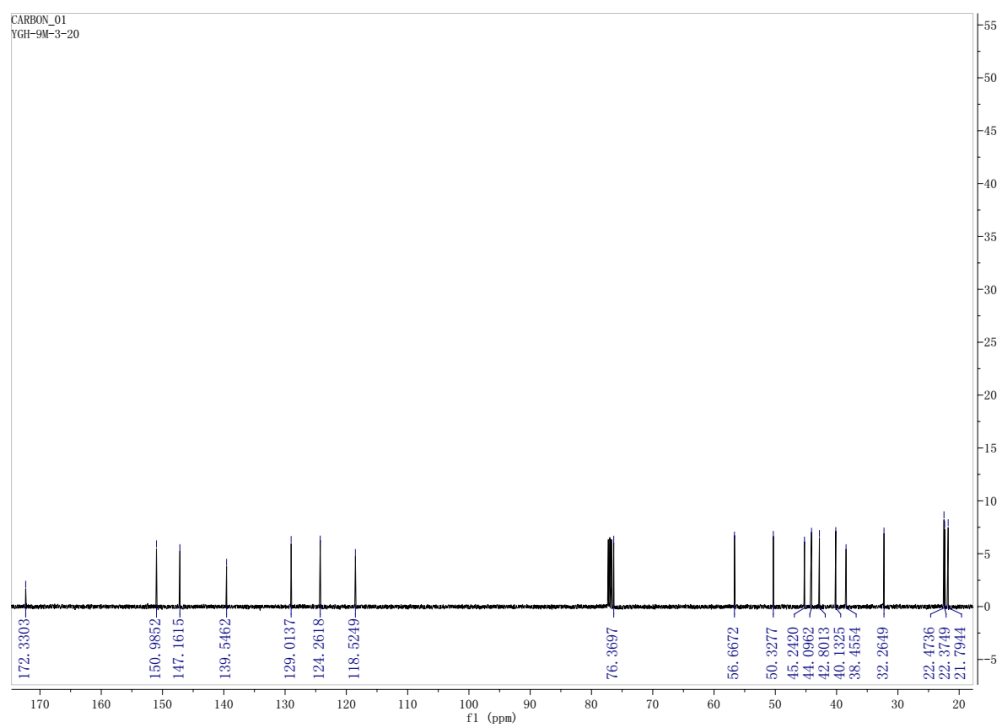


Figure S24. HMQC Spectrum of tanzawaic acid U (**4**)

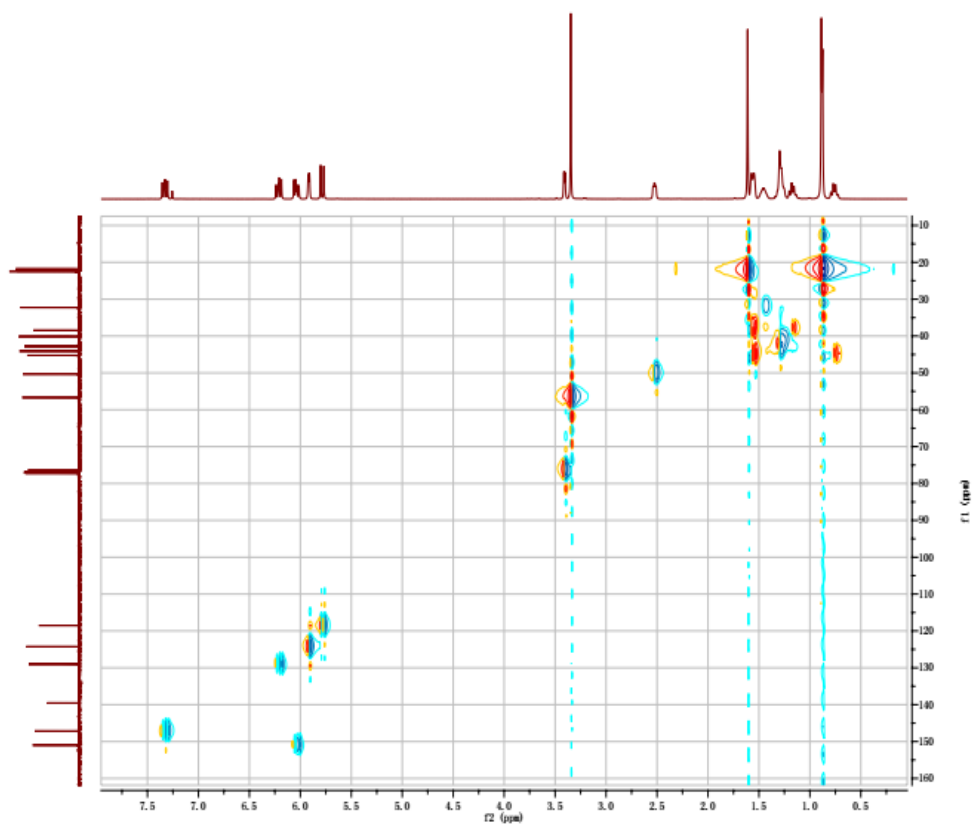


Figure S25. COSY Spectrum of tanzawaic acid U (4)

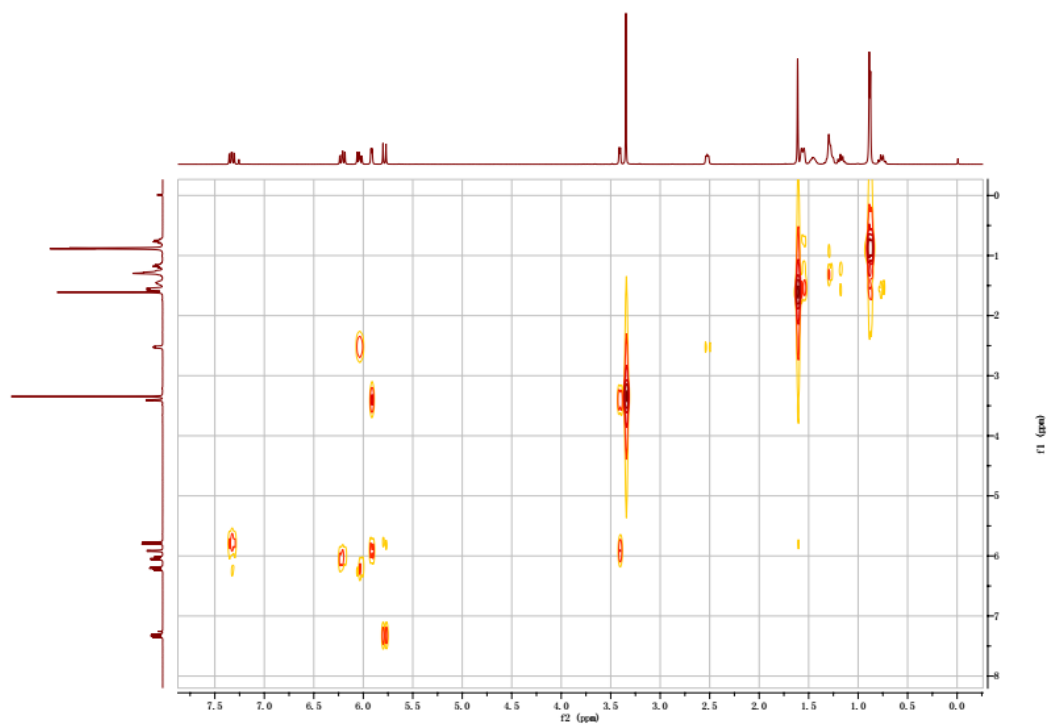


Figure S26. HMBC Spectrum of tanzawaic acid U (4)

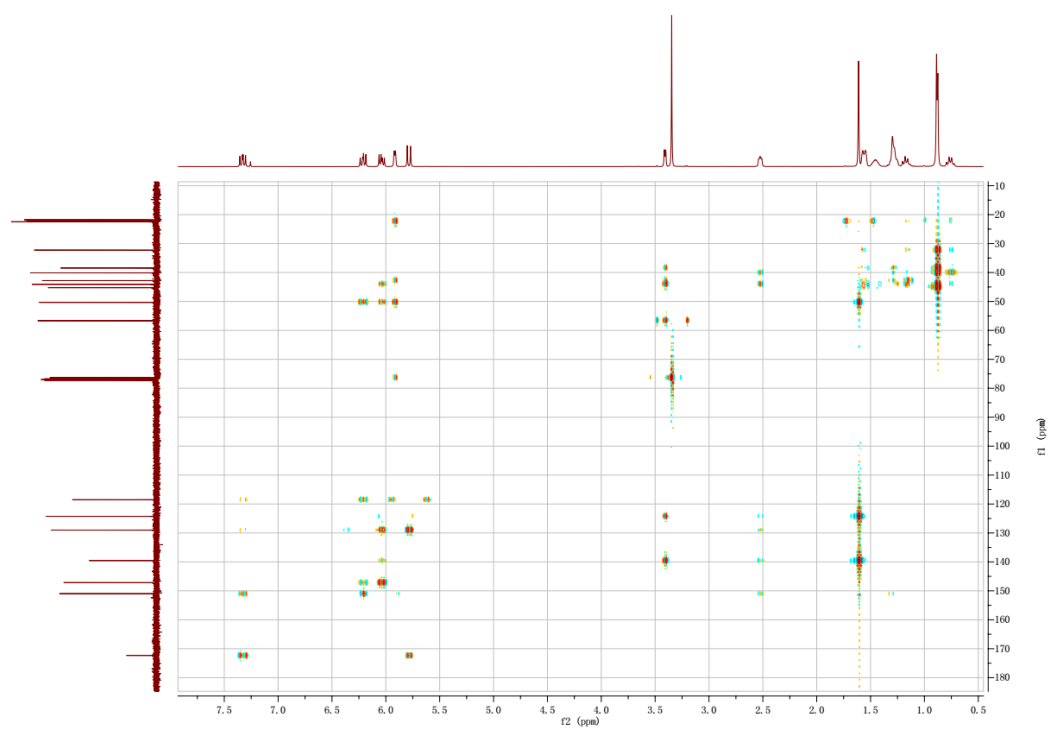


Figure S27. NOESY Spectrum of tanzawaic acid U (4)

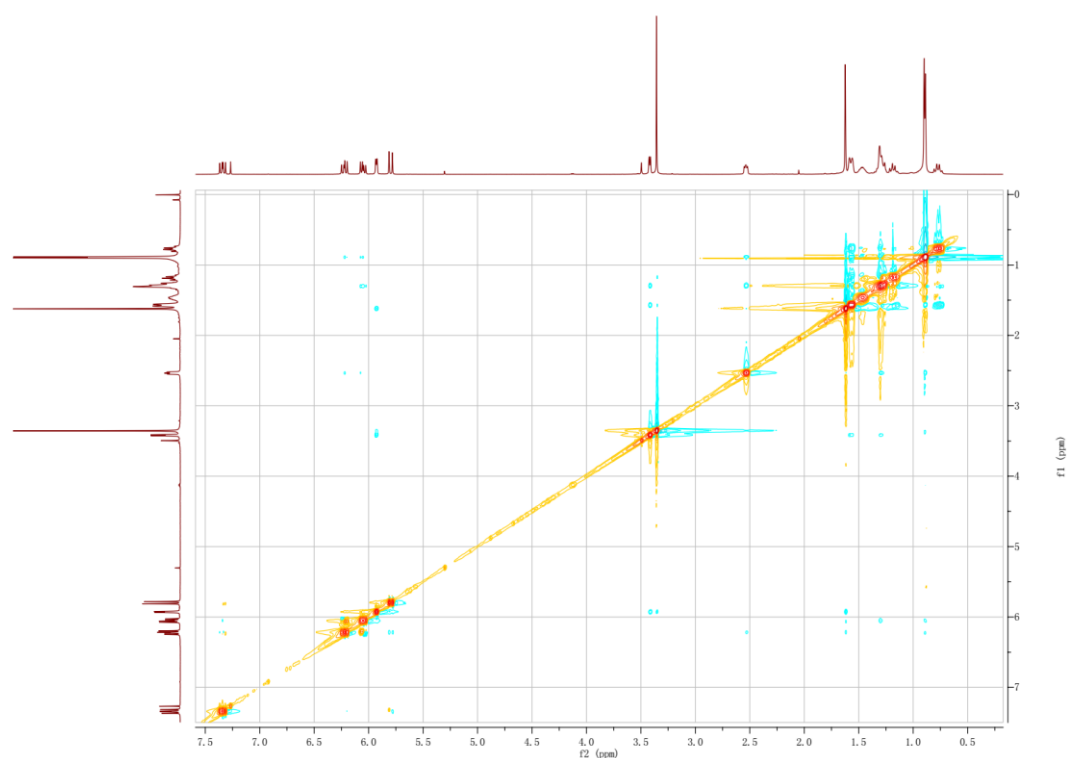


Figure S28. HRESIMS Spectrum of tanzawaic acid U (4)

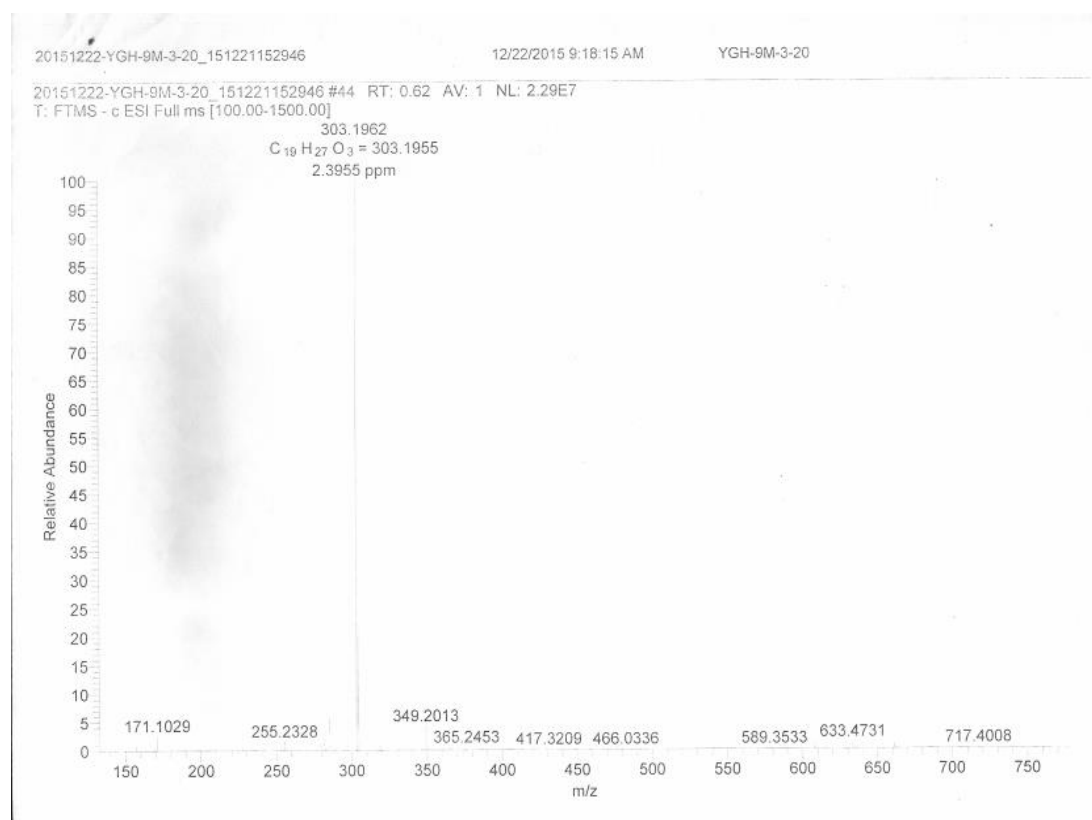


Figure S29. ^1H NMR Spectrum (500 MHz) of tanzawaic acid V (5) in Methanol- d_4

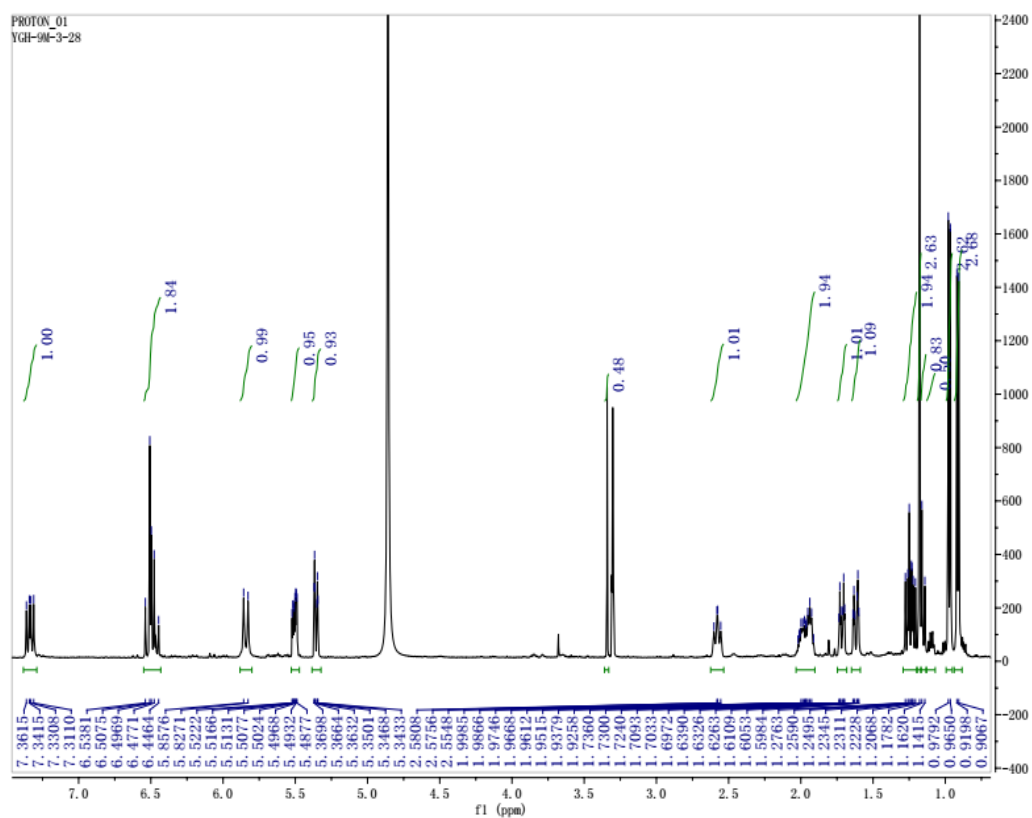


Figure S30. ^{13}C NMR Spectrum (125 MHz) of tanzawaic acid V (5) in Methanol- d_4

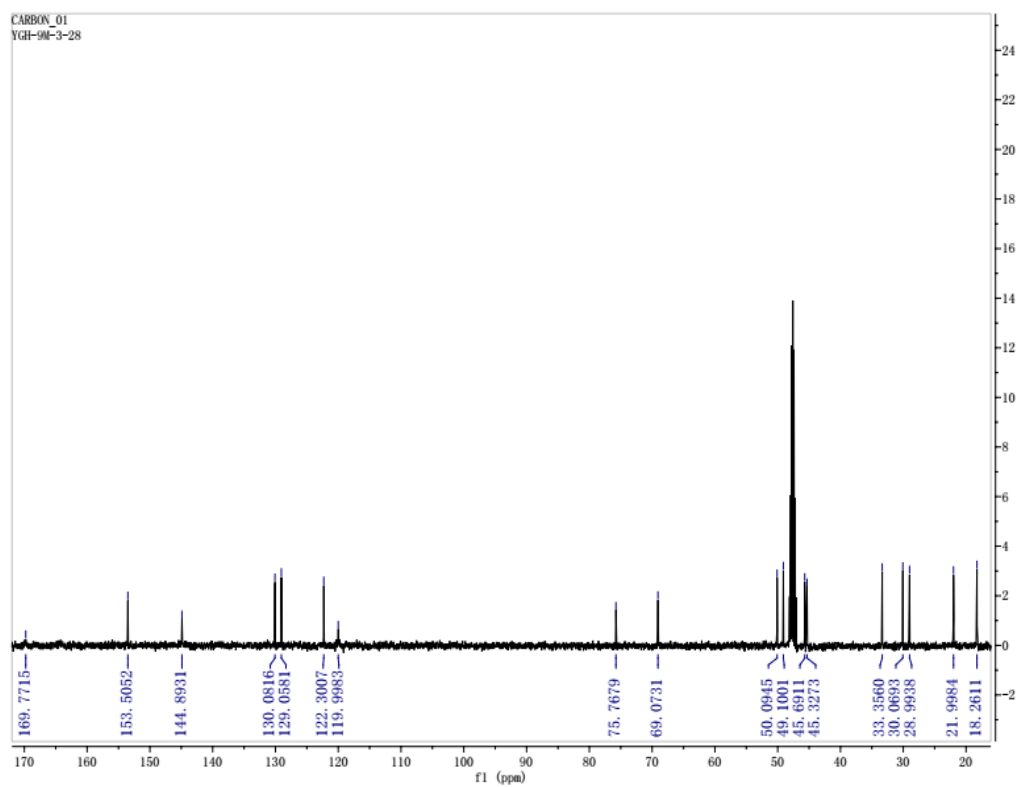


Figure S31. HMQC Spectrum of tanzawaic acid V (5)

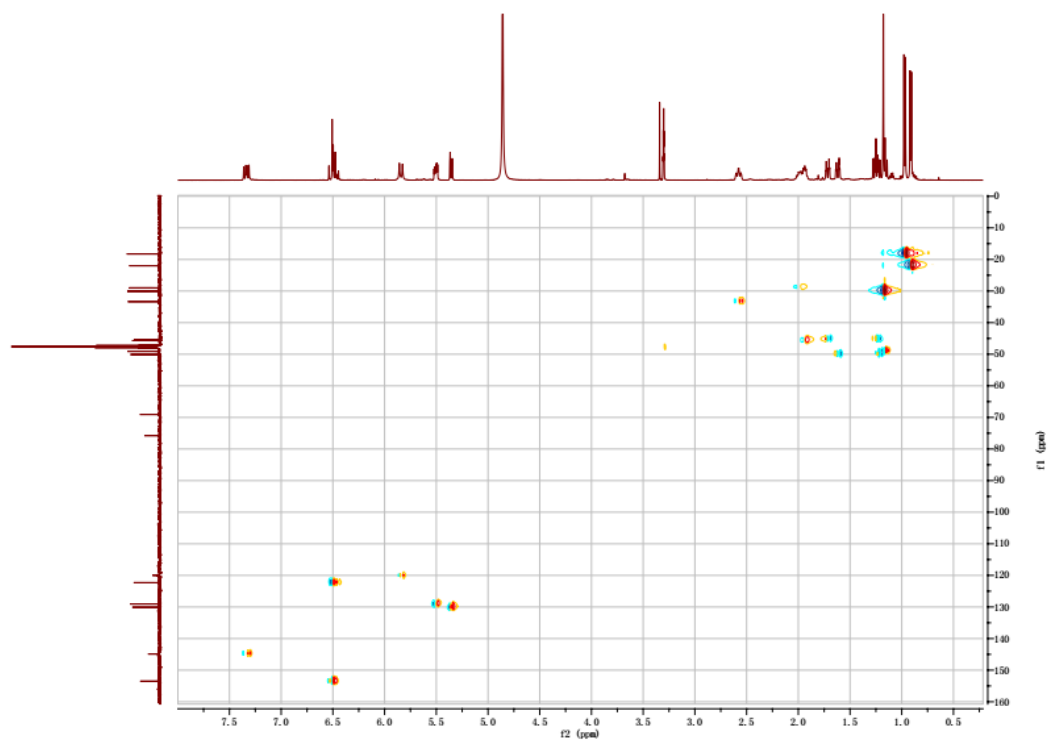


Figure S32. COSY Spectrum of tanzawaic acid V (5)



Figure S33. HMBC Spectrum of tanzawaic acid V (5)

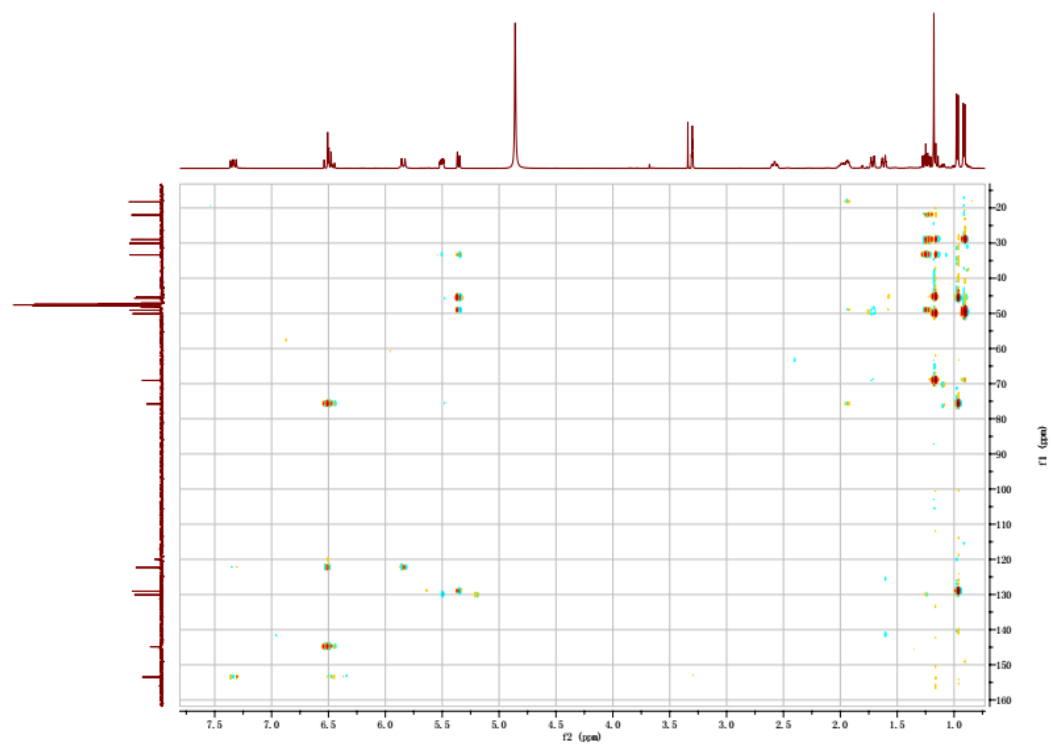


Figure S34. NOESY Spectrum of tanzawaic acid V (5)

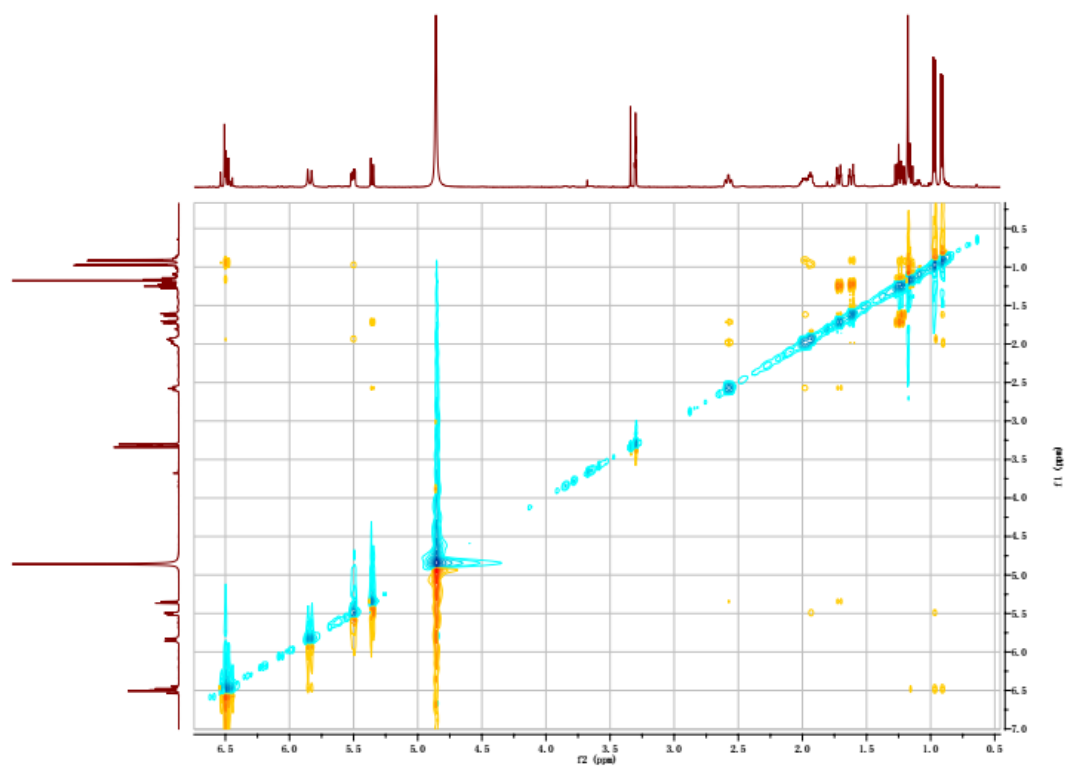


Figure S35. HRESIMS Spectrum of tanzawaic acid V (5)

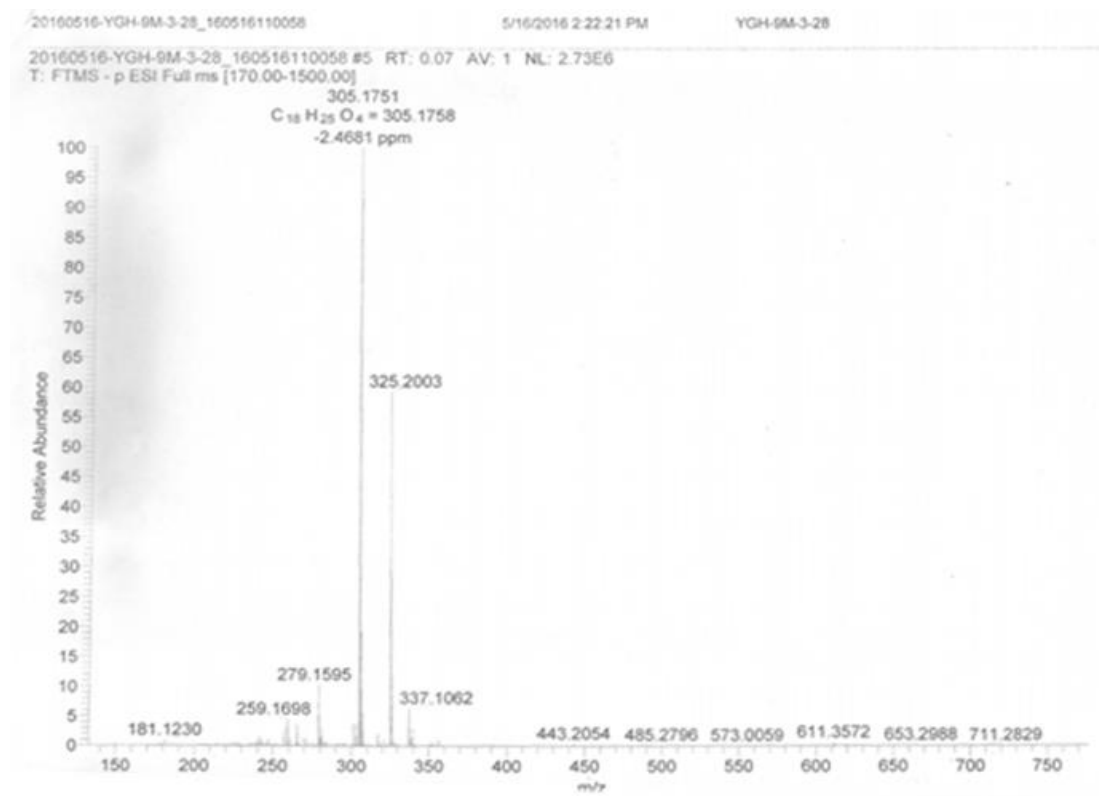


Figure S36. 1H NMR Spectrum (500 MHz) of tanzawaic acid W (6) in $CDCl_3$

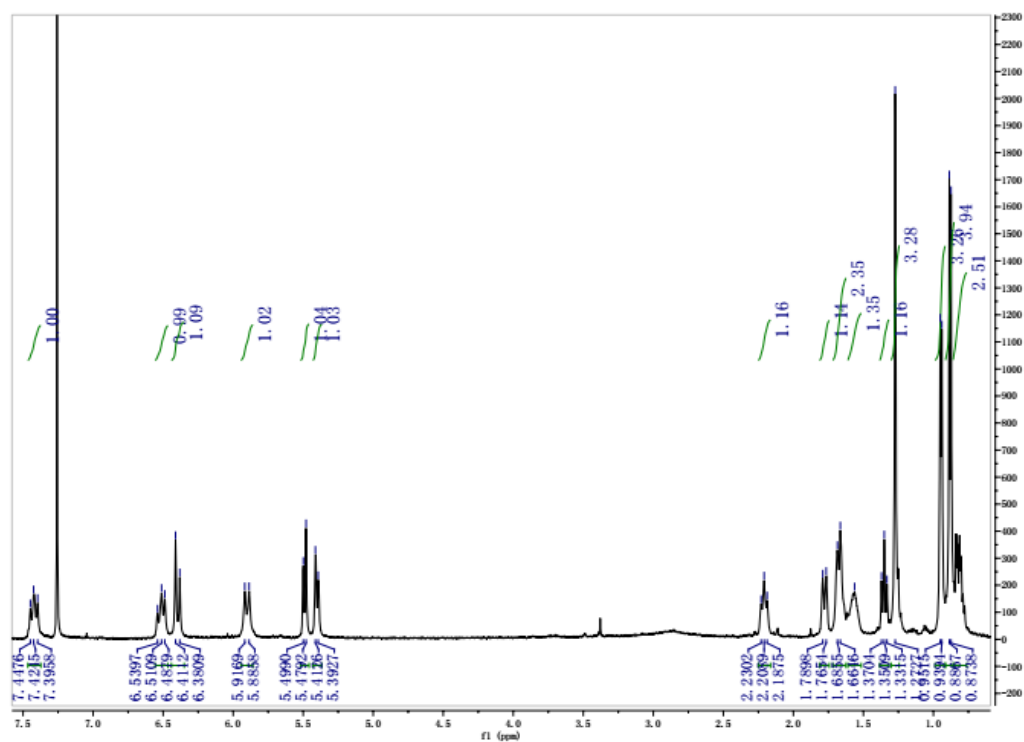


Figure S37. ^{13}C NMR Spectrum (125 MHz) of tanzawaic acid W (**6**) in CDCl_3

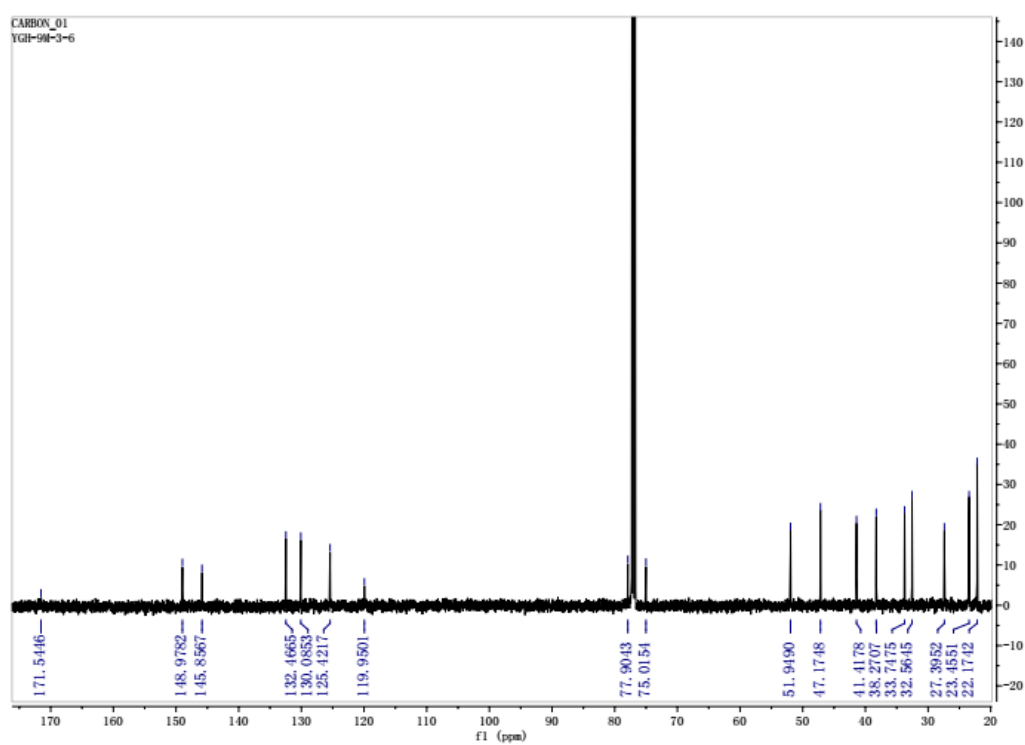


Figure S38. HMQC Spectrum of tanzawaic acid W (**6**)

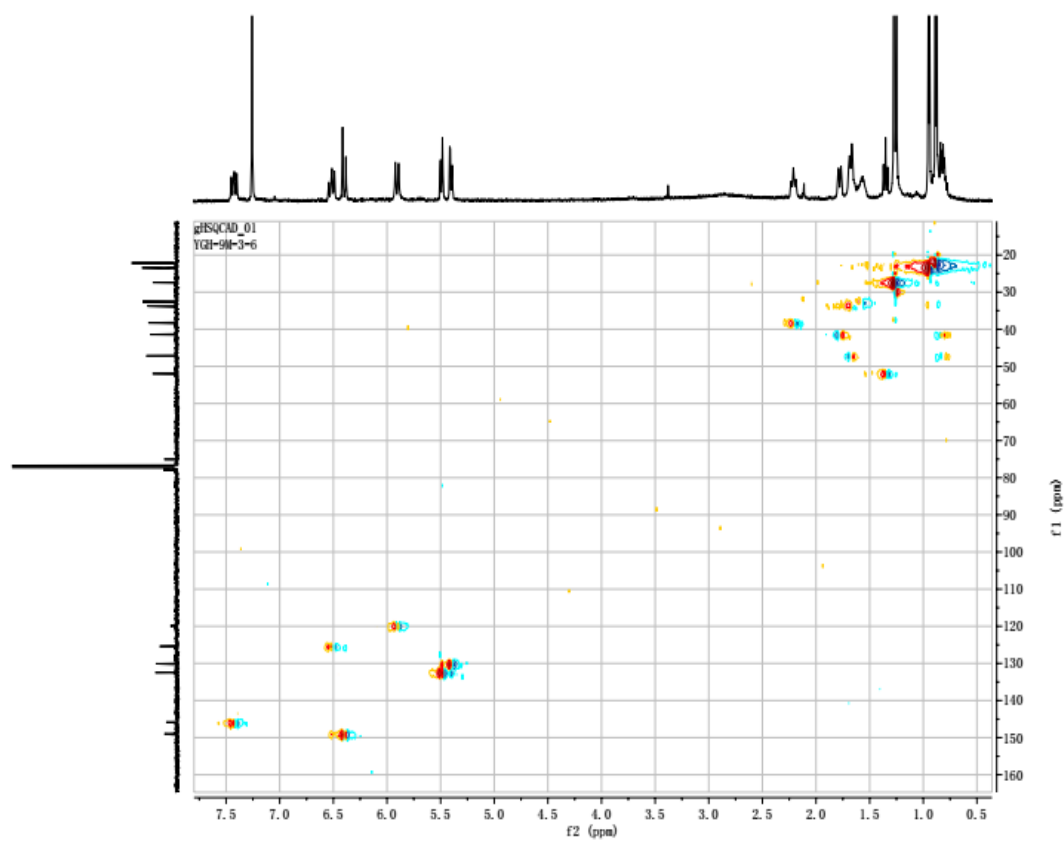


Figure S39. COSY Spectrum of tanzawaic acid W (6)

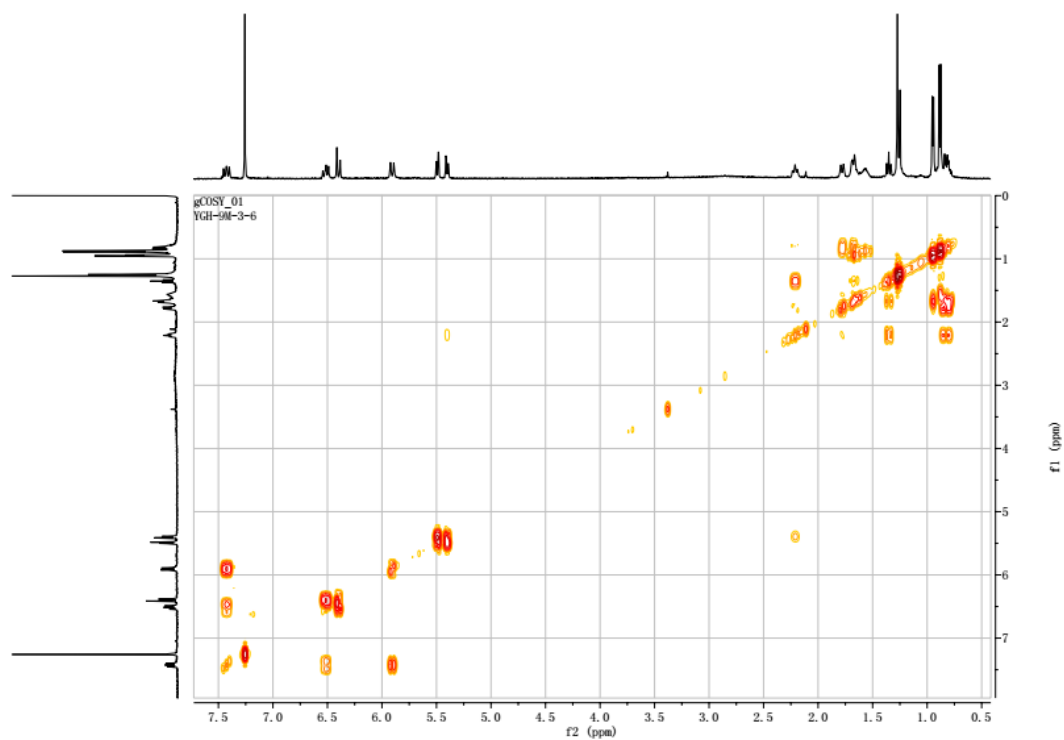


Figure S40. HMBC Spectrum of tanzawaic acid W (6)

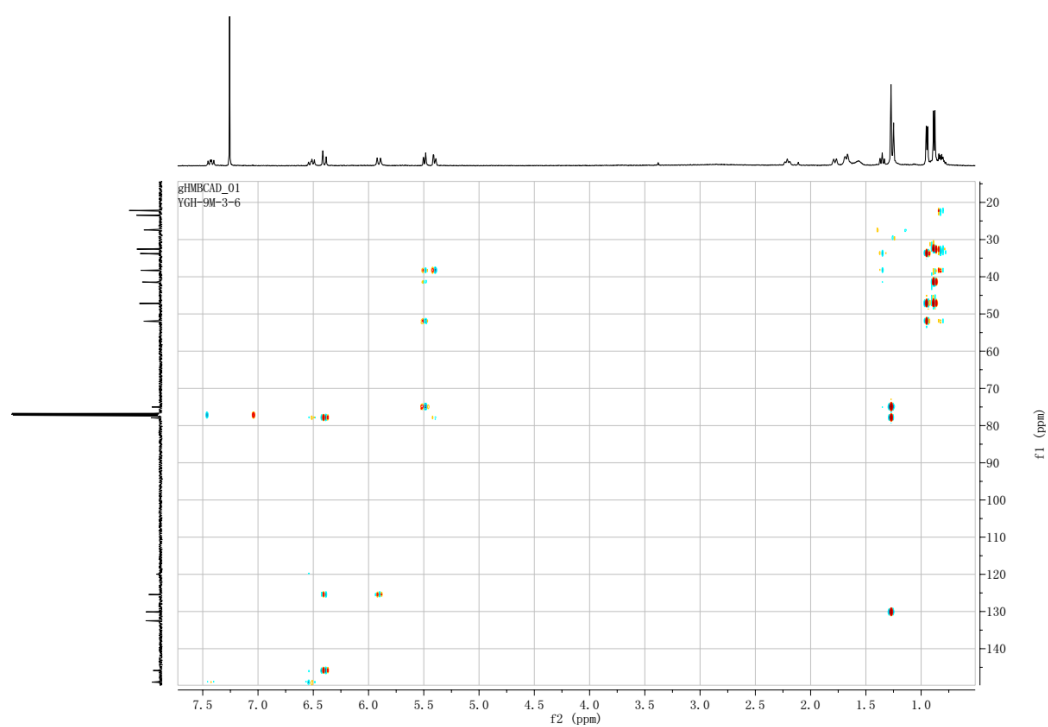


Figure S41. NOESY Spectrum of tanzawaic acid W (6)

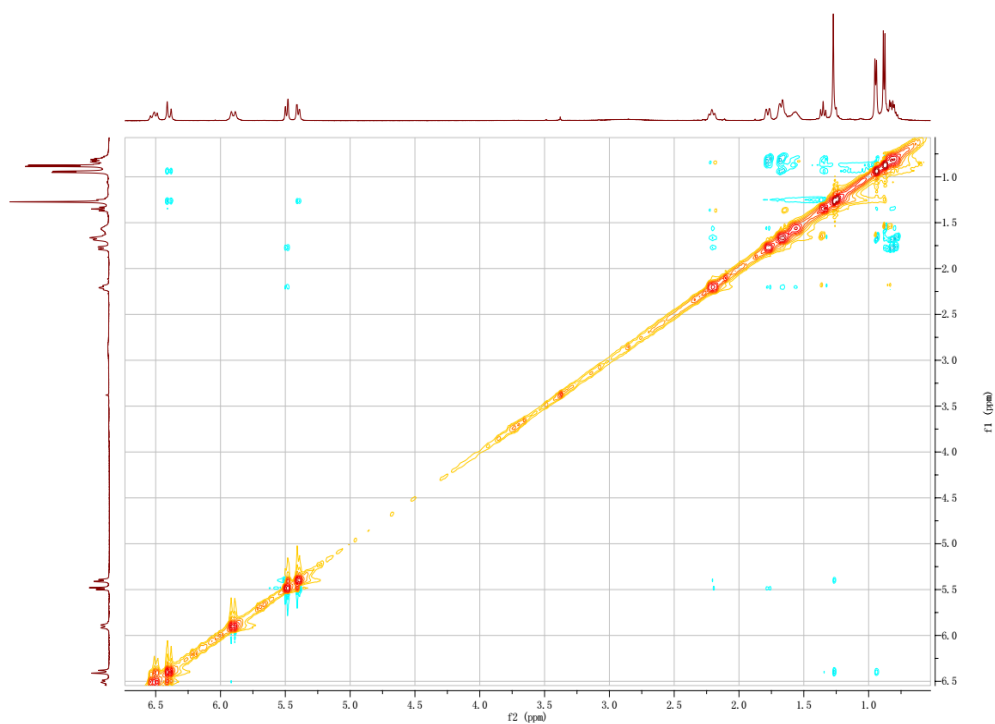


Figure S42. HRESIMS Spectrum of tanzawaic acid W (6)

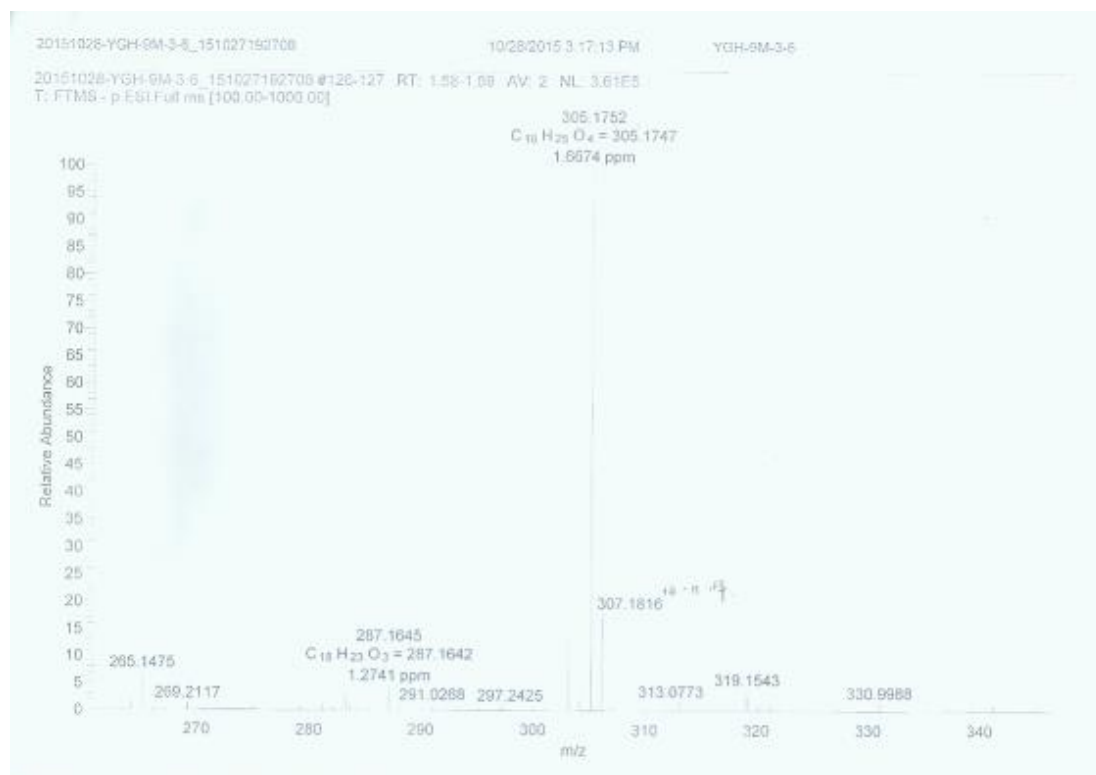


Figure S43. ^1H NMR Spectrum (500 MHz) of tanzawaic acid X (**11**) in CDCl_3

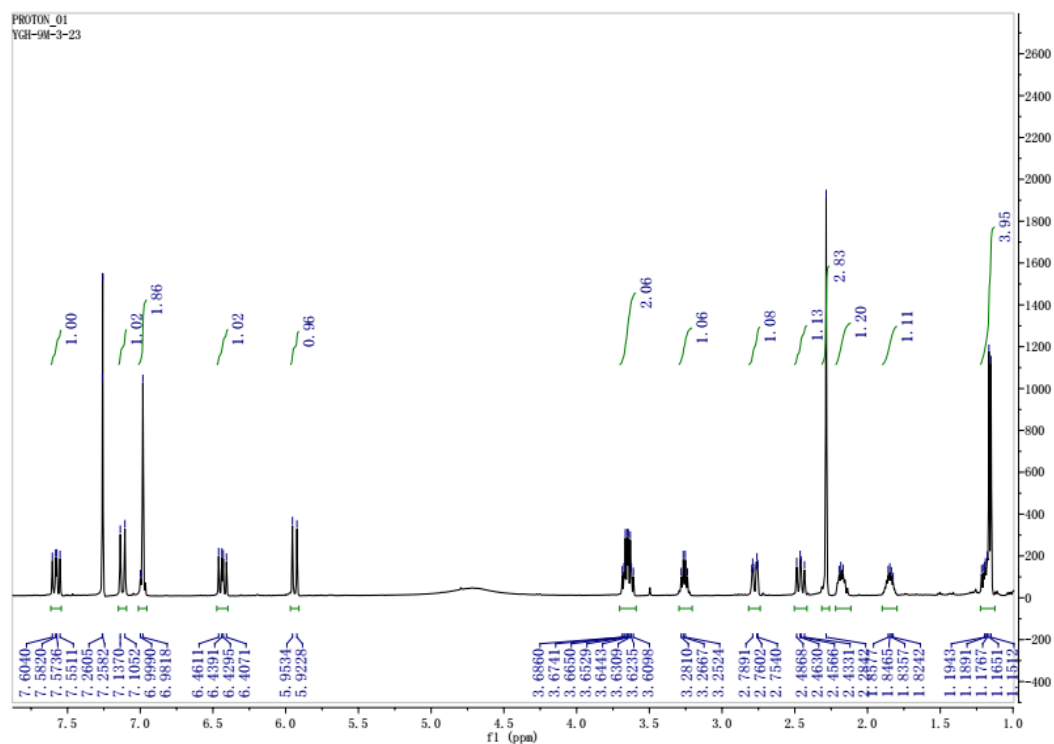


Figure S44. ^{13}C NMR Spectrum (125 MHz) of tanzawaic acid X (**11**) in CDCl_3

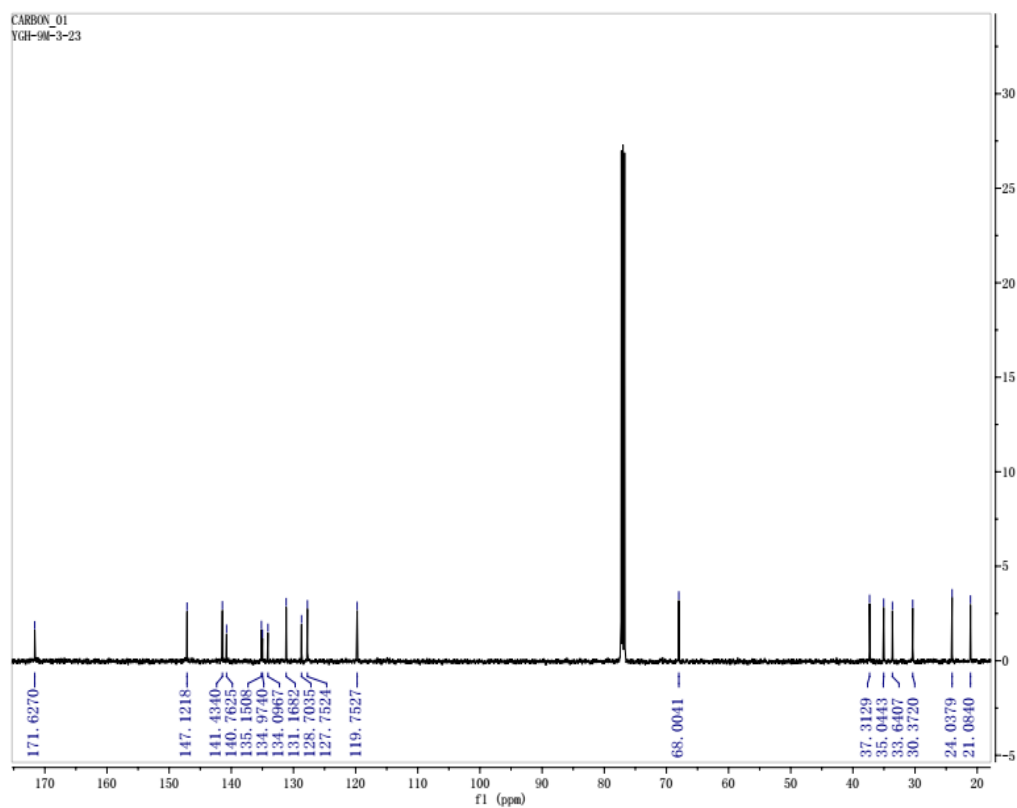


Figure S45. HMQC Spectrum of tanzawaic acid X (**11**)

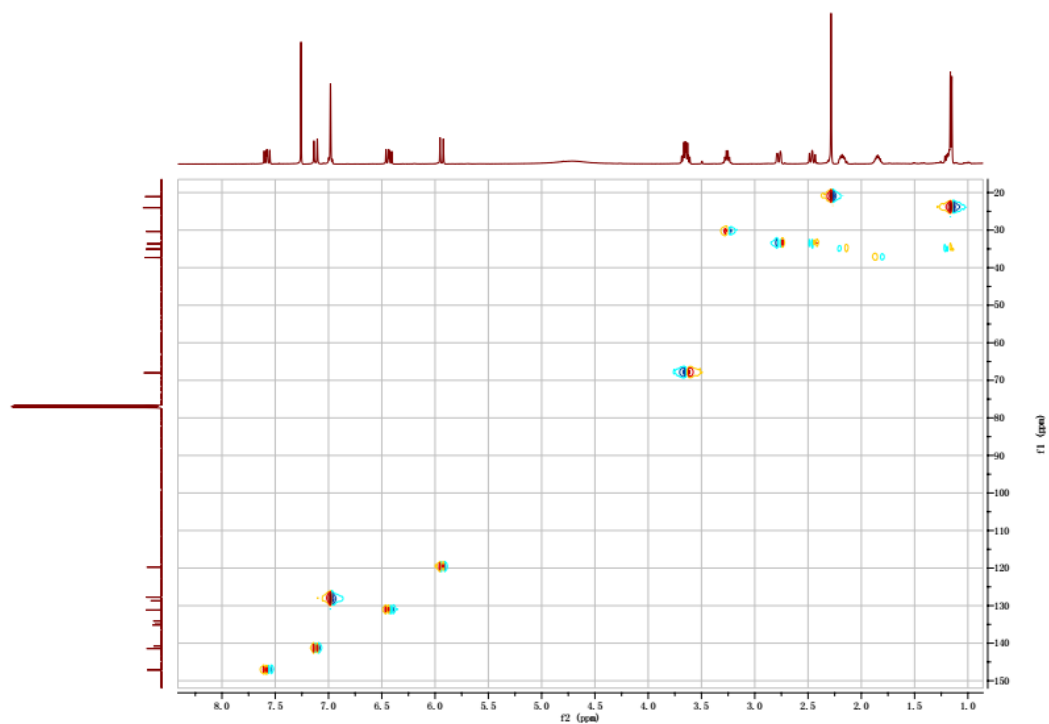


Figure S46. COSY Spectrum of tanzawaic acid X (**11**)

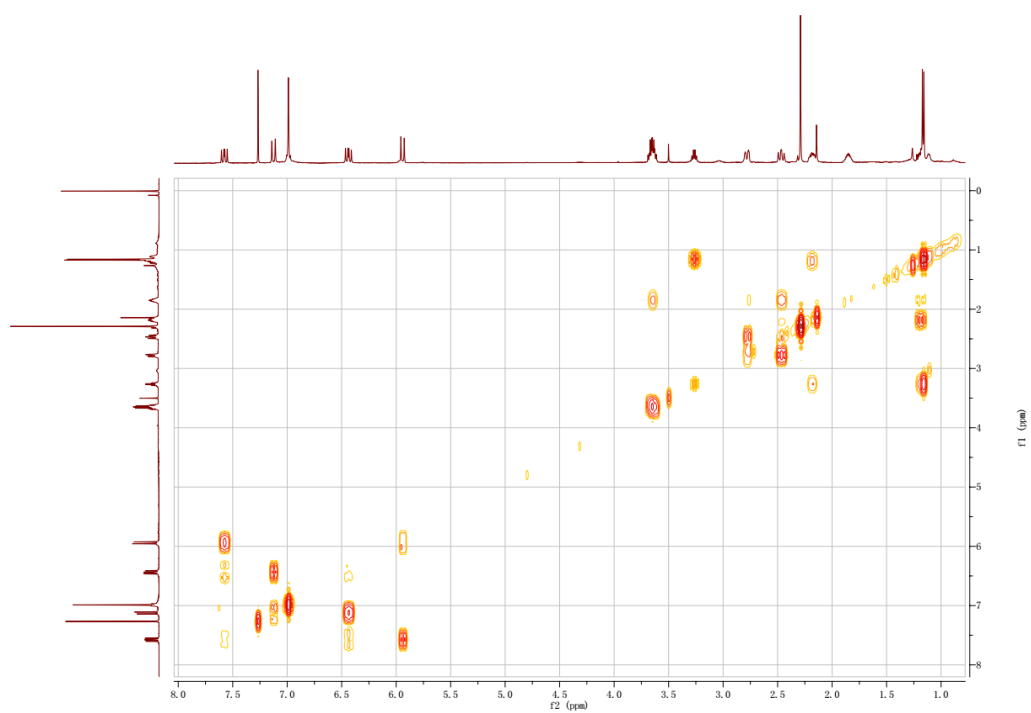


Figure S47. HMBC Spectrum of tanzawaic acid X (**11**)

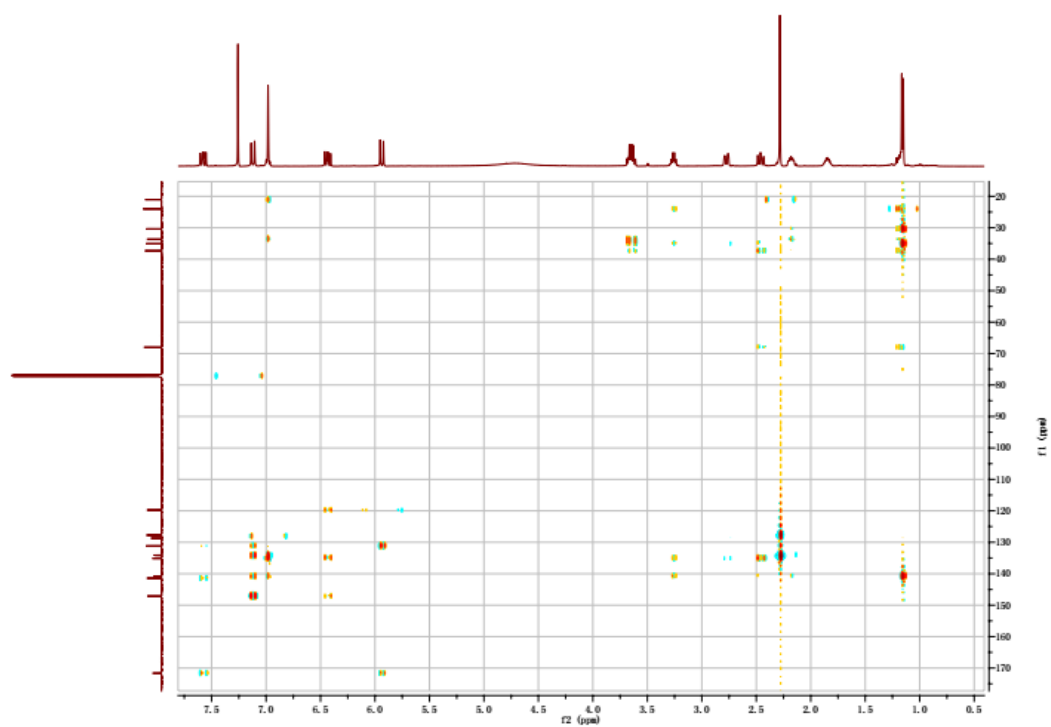


Figure S48. NOESY Spectrum of tanzawaic acid X (**11**)

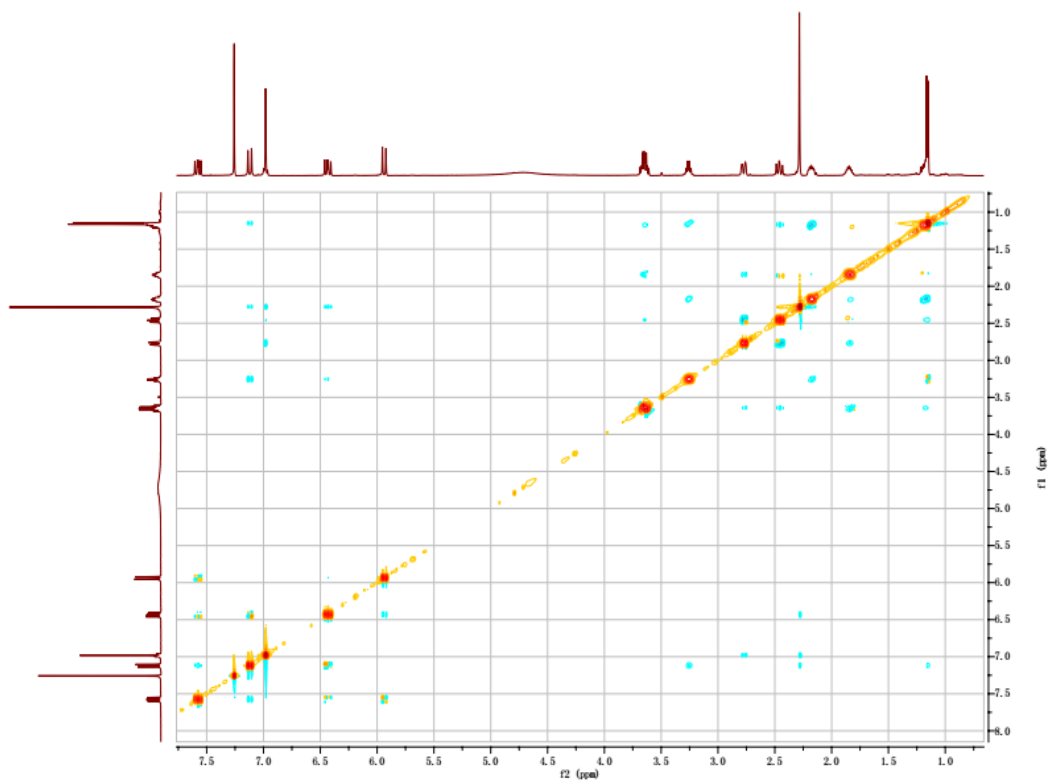


Figure S49. HRESIMS Spectrum of tanzawaic acid X (**11**)

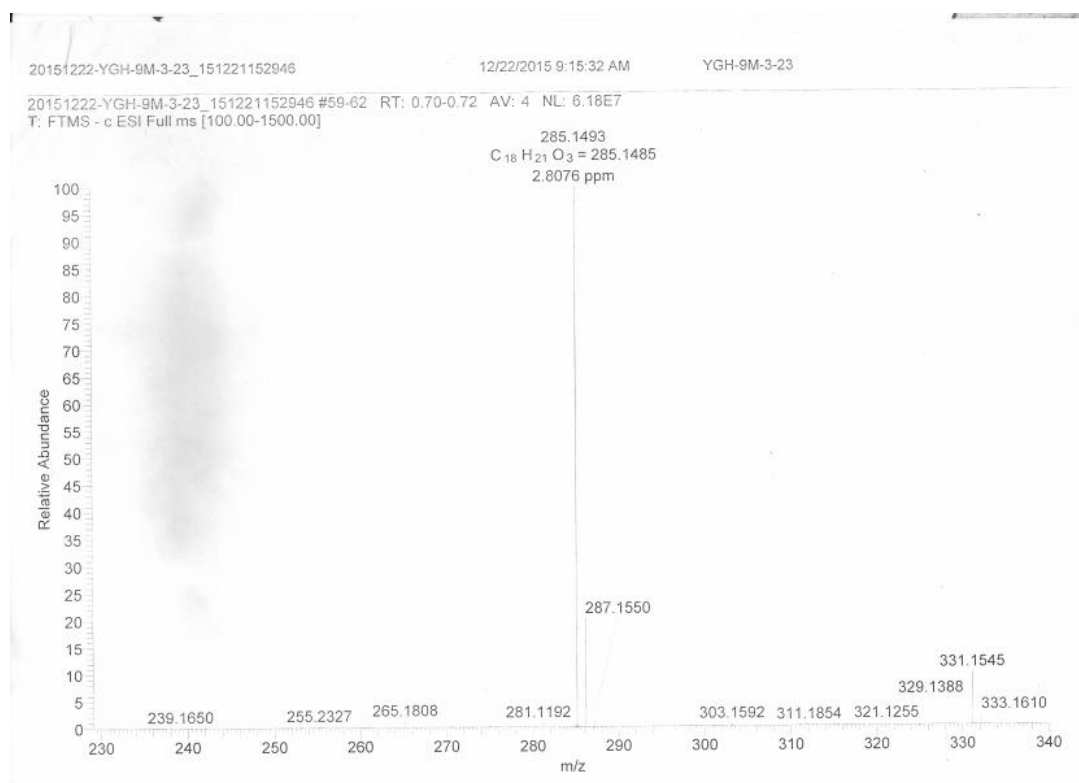


Figure S50. ¹H NMR Spectrum (500 MHz) of **1a** in Methanol-*d*₄

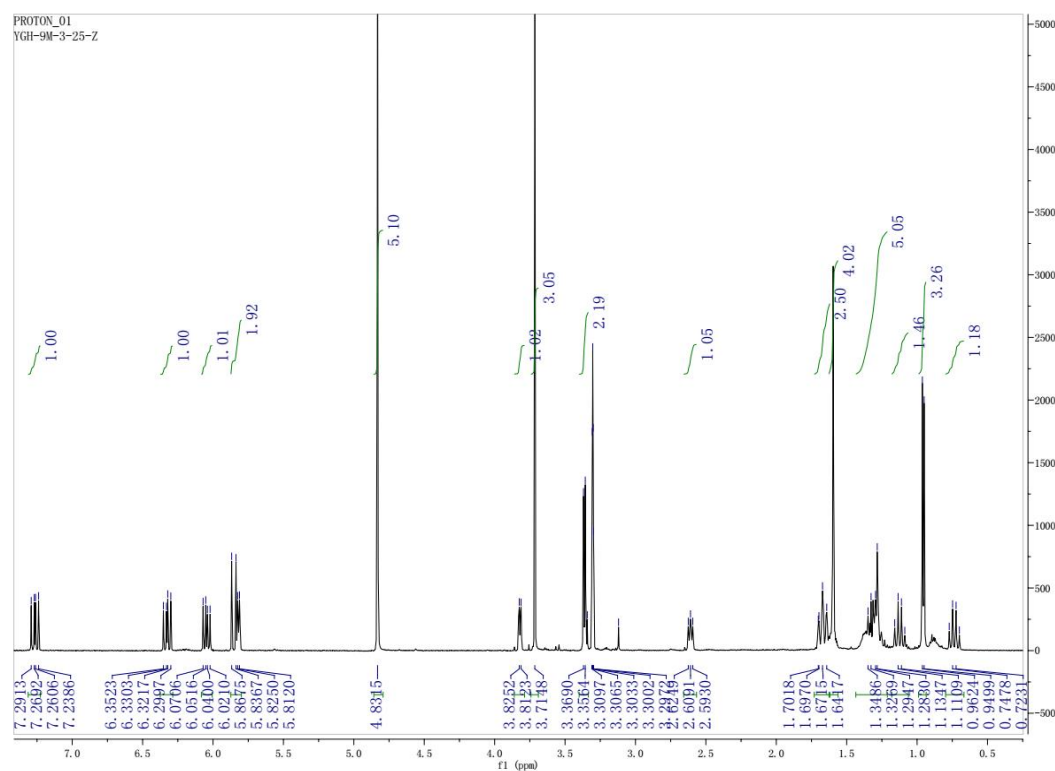


Figure S51. ^1H NMR Spectrum (500 MHz) of **1b** in Methanol- d_4

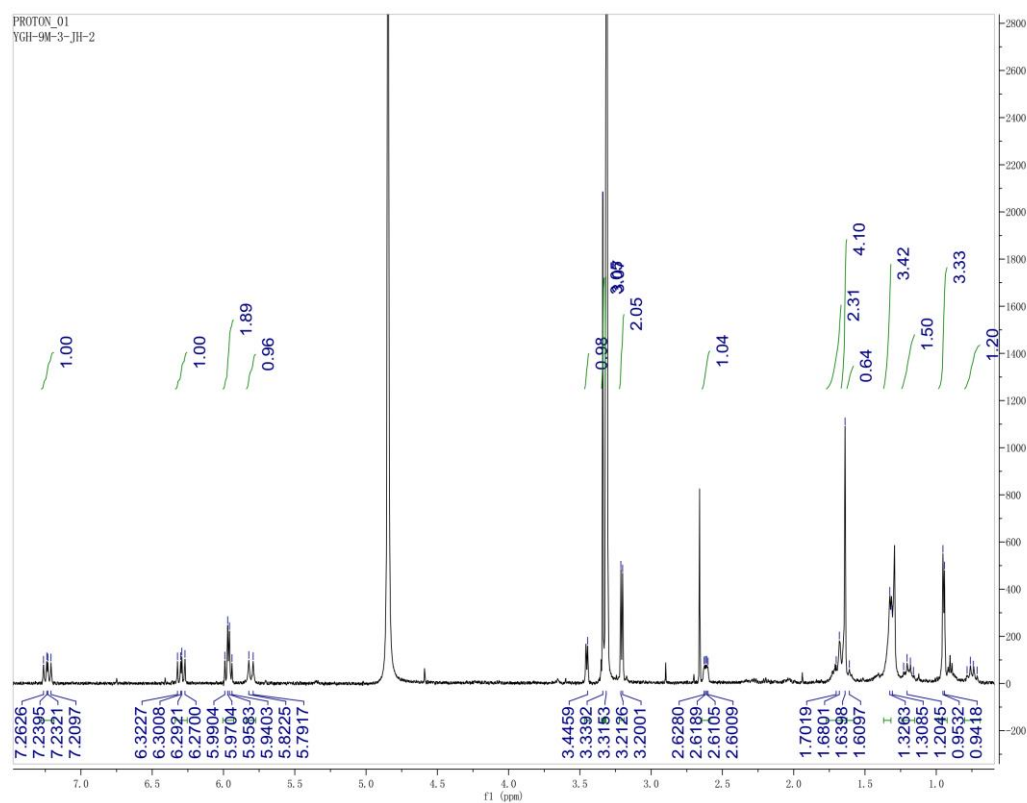


Figure S52. ^{13}C NMR Spectrum (125 MHz) of **1b** in Methanol- d_4

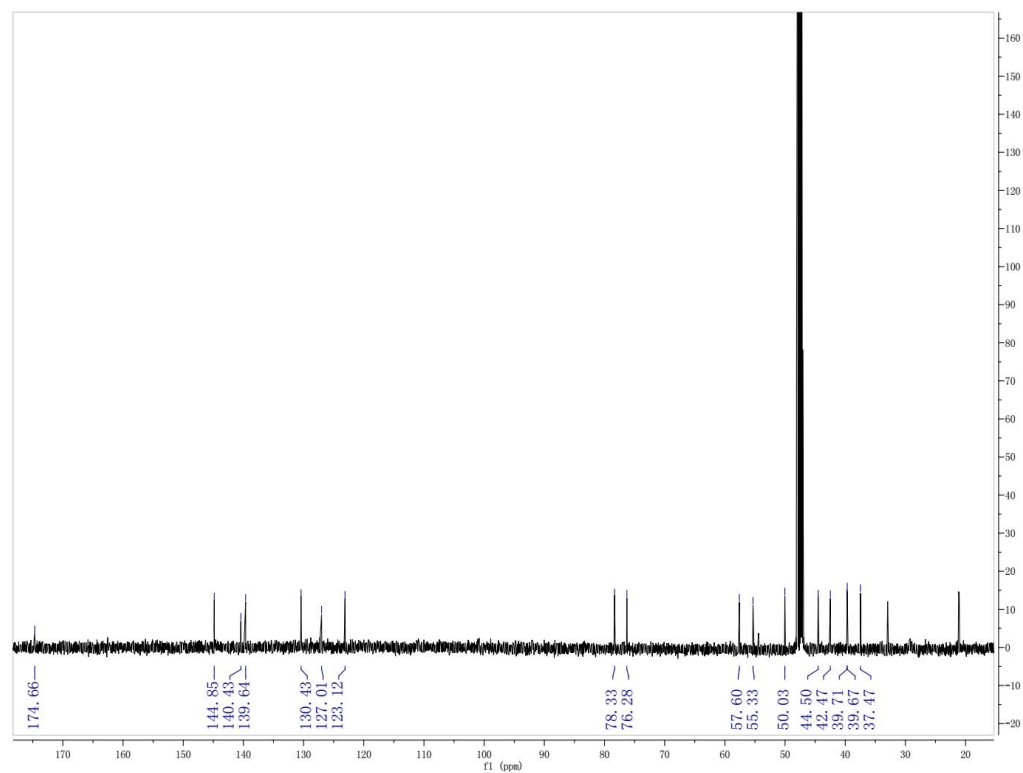


Figure S53. ^1H NMR Spectrum (500 MHz) of **12a** in CDCl_3

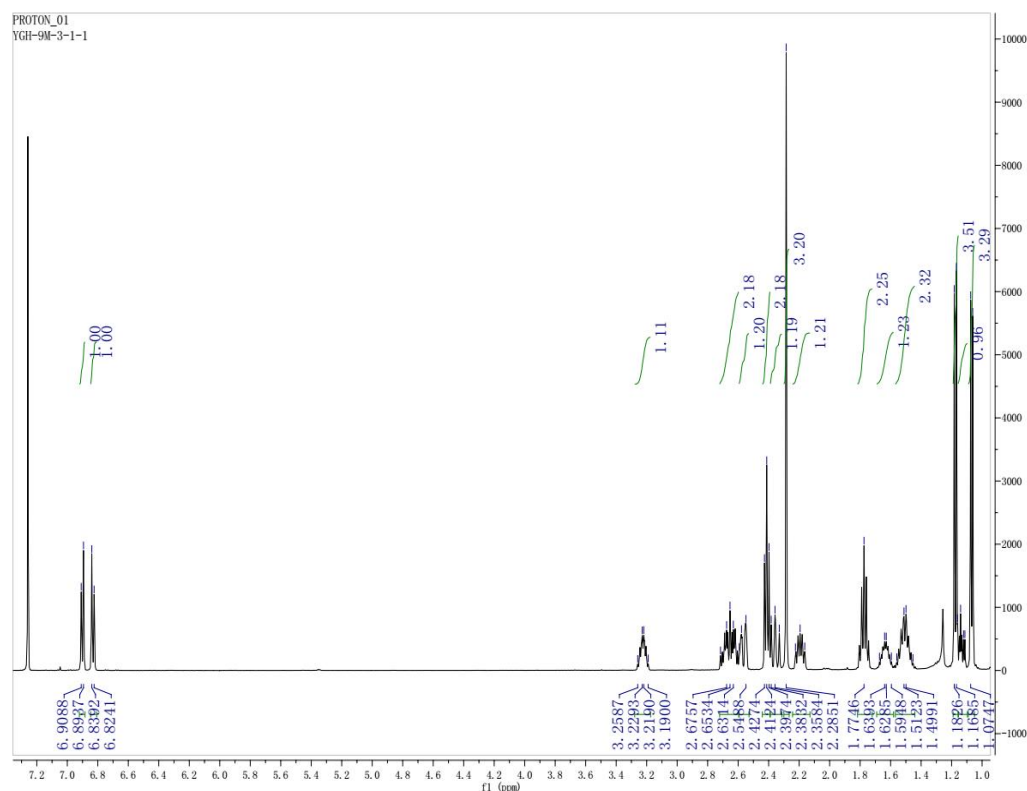


Figure S54. ^{13}C NMR Spectrum (125 MHz) of **12a** in CDCl_3

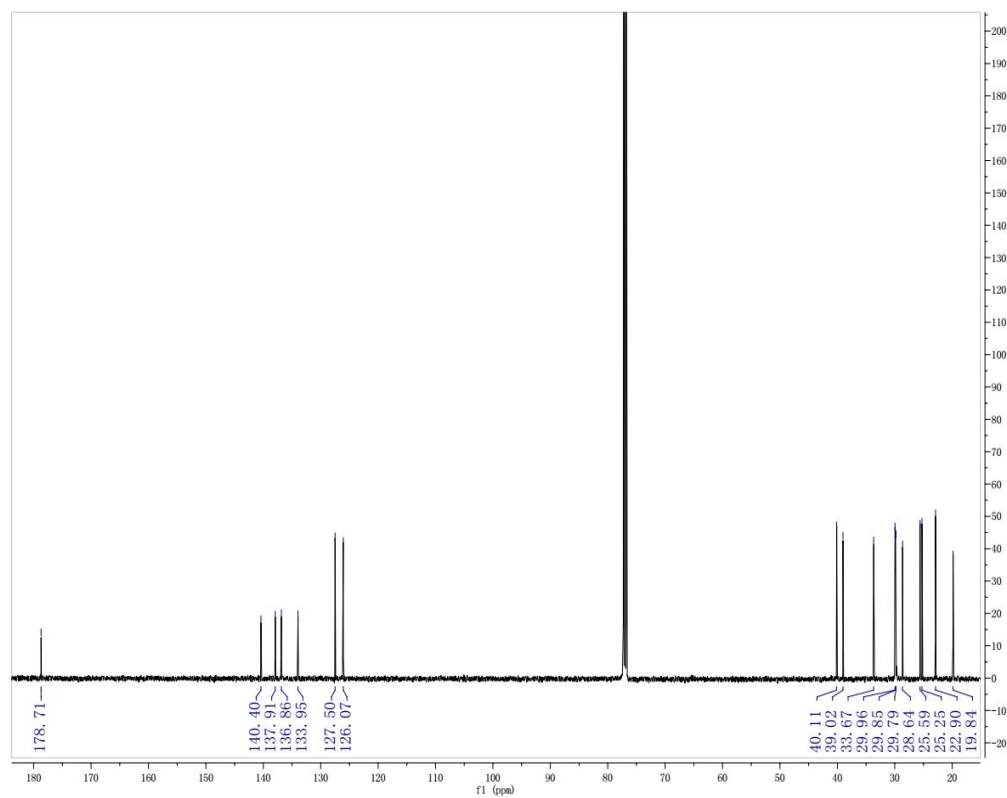


Figure S55. IR spectrum of tanzawaic acid R (1)

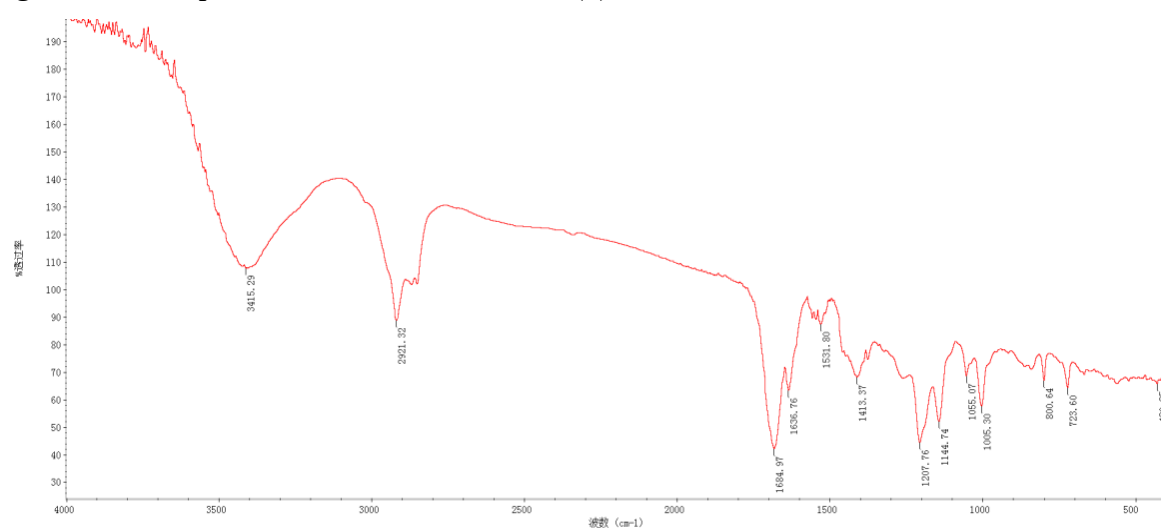


Figure S56. IR spectrum of tanzawaic acid S (2)

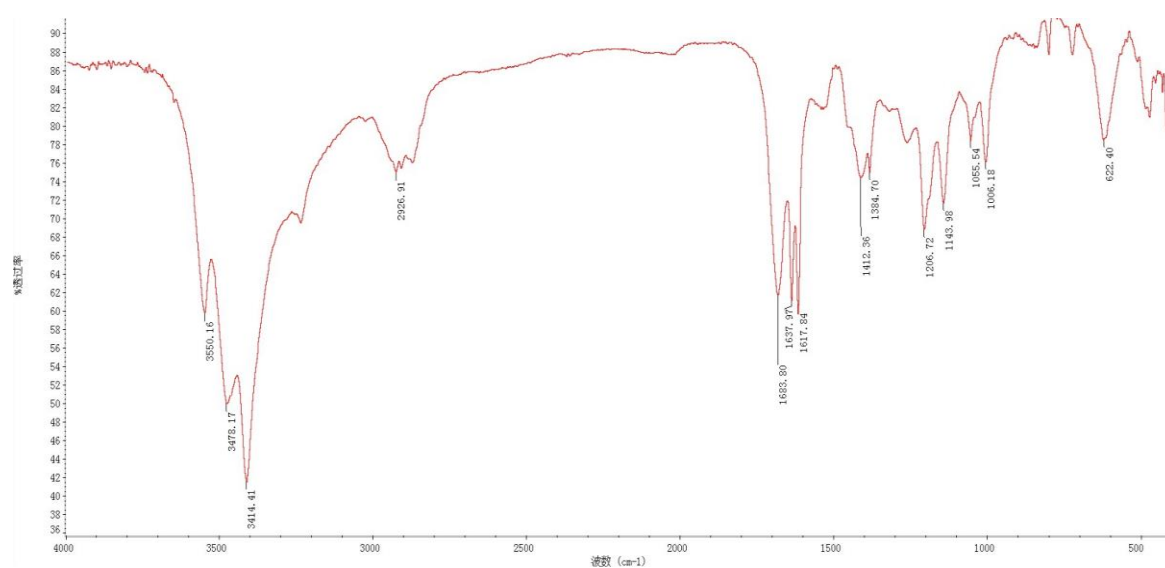


Figure S57. IR spectrum of tanzawaic acid T (3)

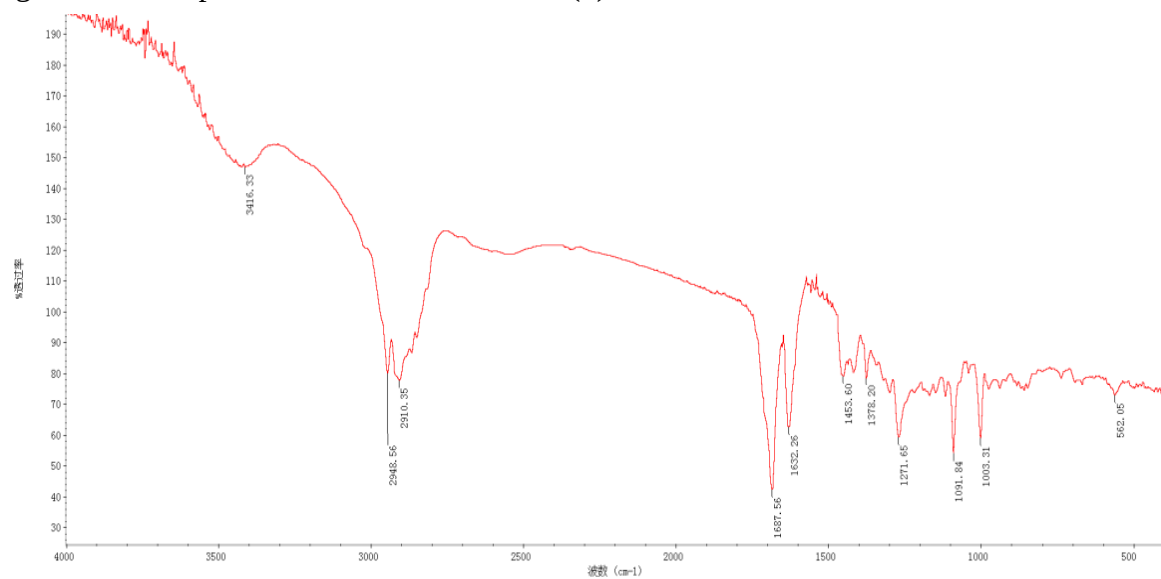


Figure S58. IR spectrum of tanzawaic acid U (4)

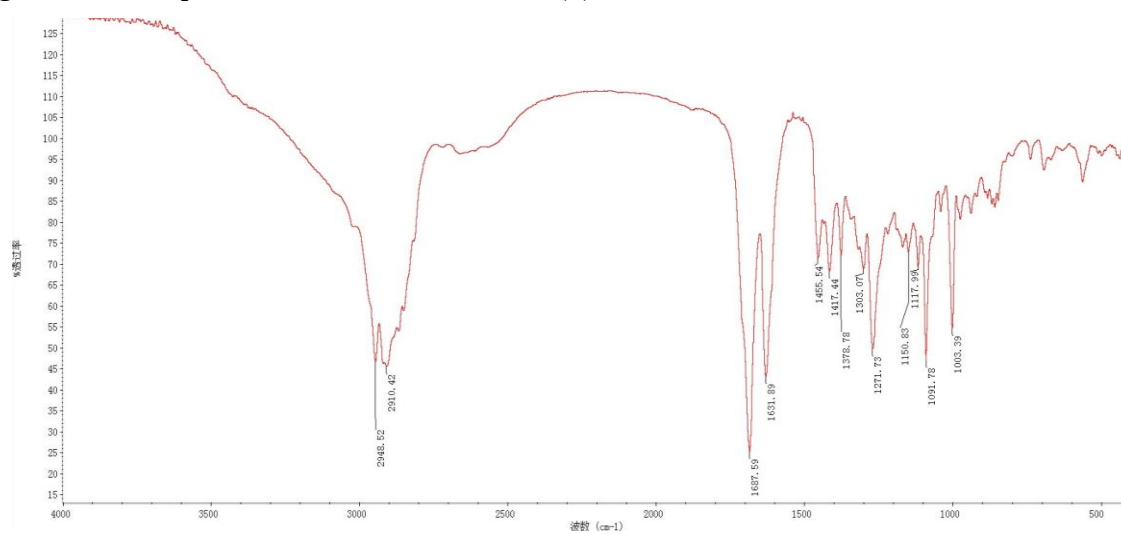


Figure S59. IR spectrum of tanzawaic acid V (5)

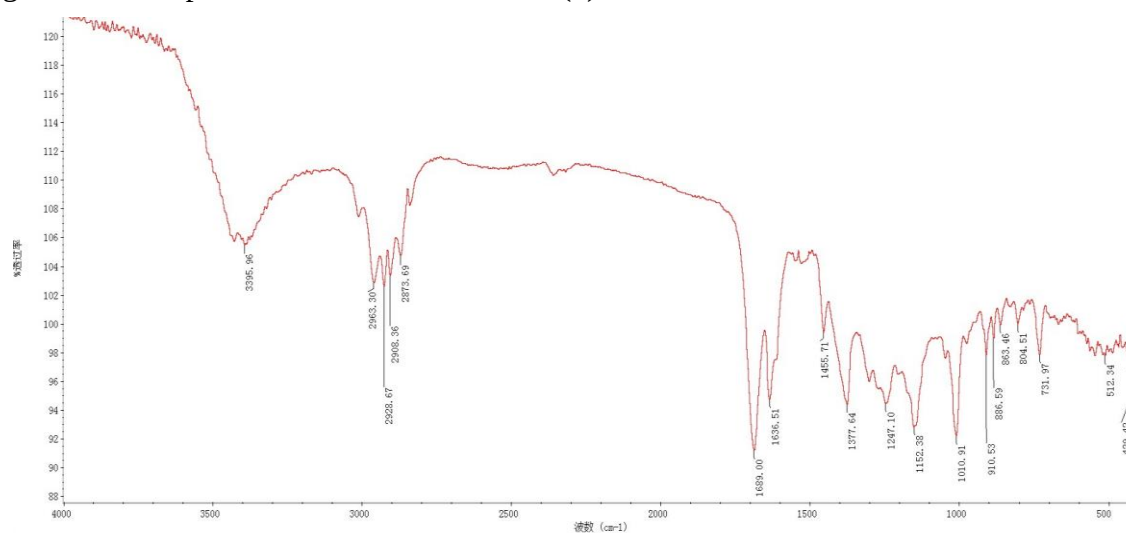


Figure S60. IR spectrum of tanzawaic acid W (6)

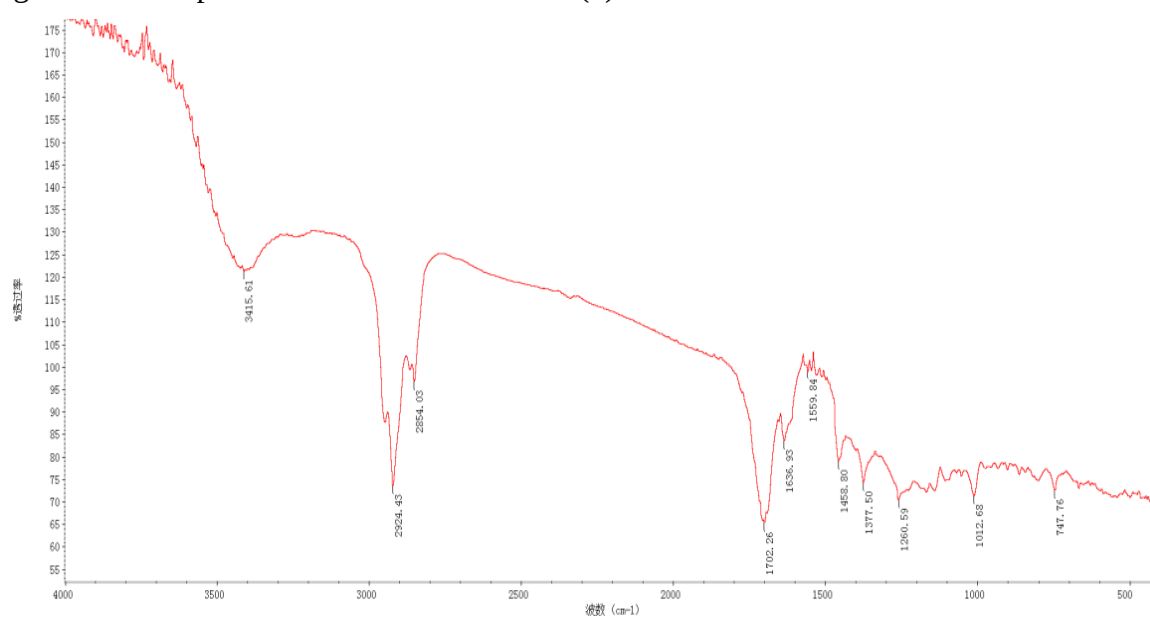


Figure S61. IR spectrum of tanzawaic acid X (**11**)

