

Supplementary Information

The streptazolin and obscurolide-type metabolites from soil-derived *Streptomyces alboniger* YIM20533 and the influence mechanism of γ -butyrolactone on growth of *Streptomyces* by their non-enzymatic reaction biosynthesis

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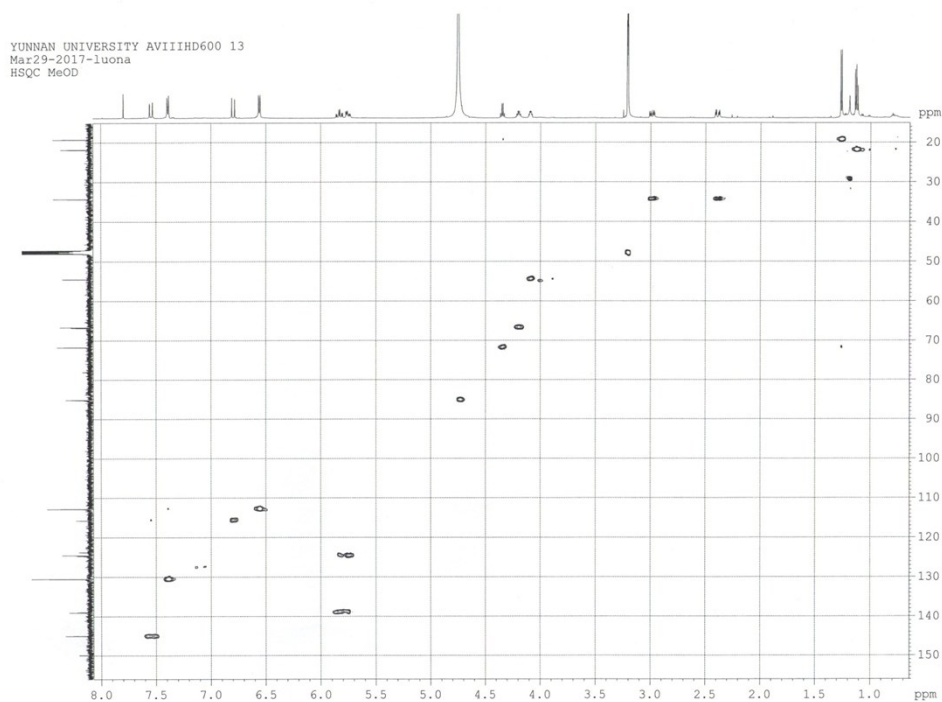


Figure S3. HSQC spectrum of compound (**1**) in MeOD.

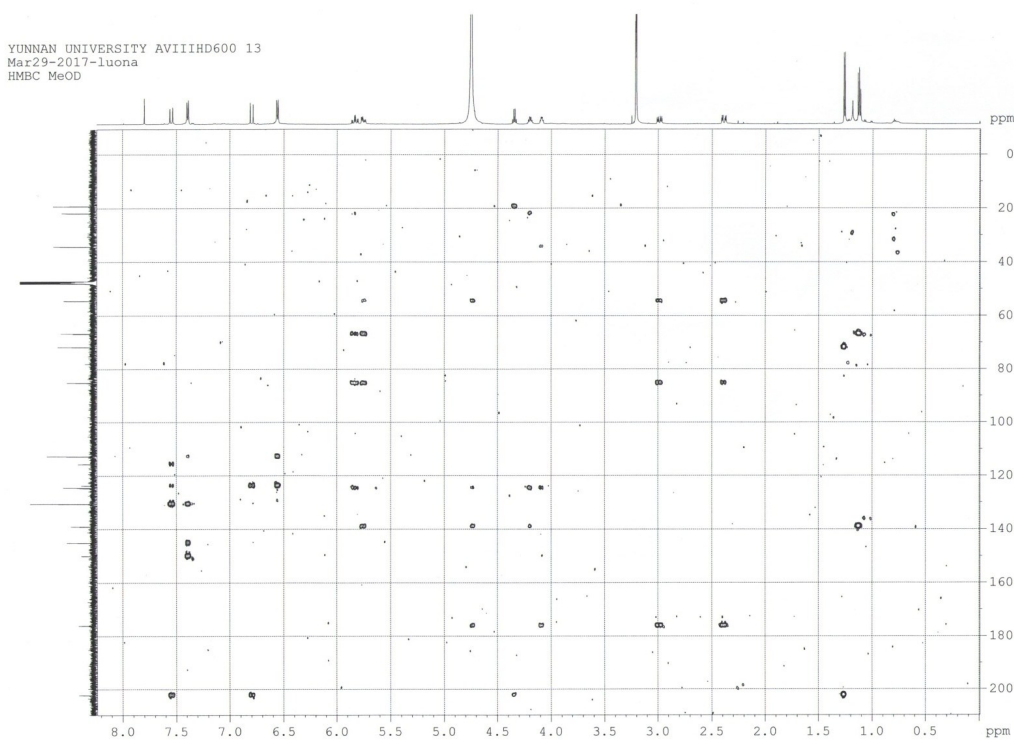


Figure S4. HMBC spectrum of compound (**1**) in MeOD.

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Mar29-2017-luona
COSY MeOD

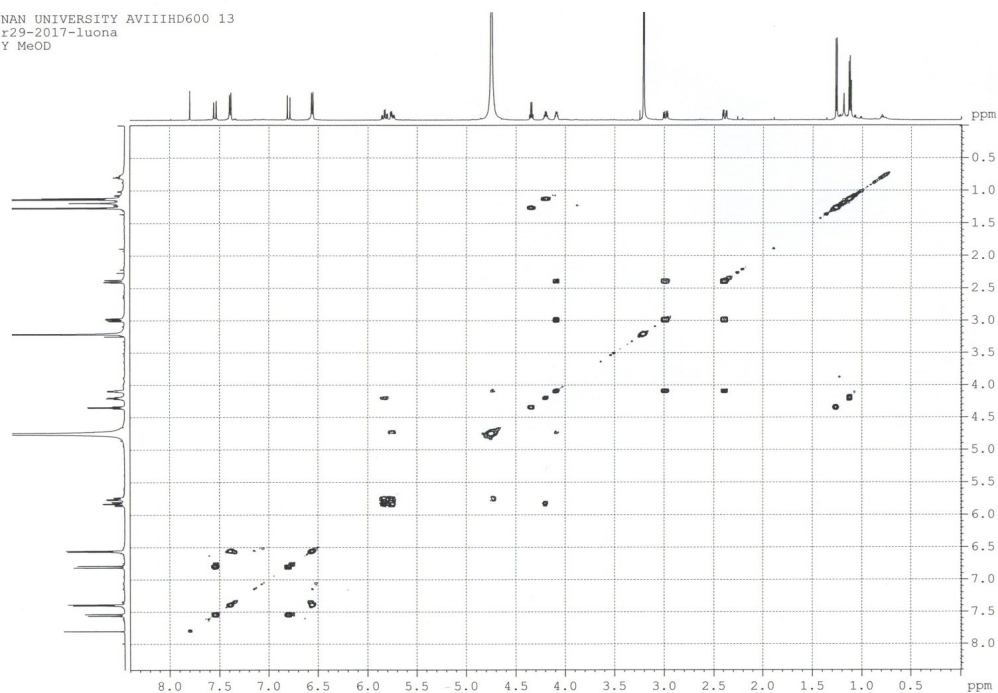


Figure S5. ¹H-¹H COSY spectrum of compound (1) in MeOD.

YUNNAN UNIVERSITY AVIIHD600 13
Mar29-2017-luona
ROESY MeOD

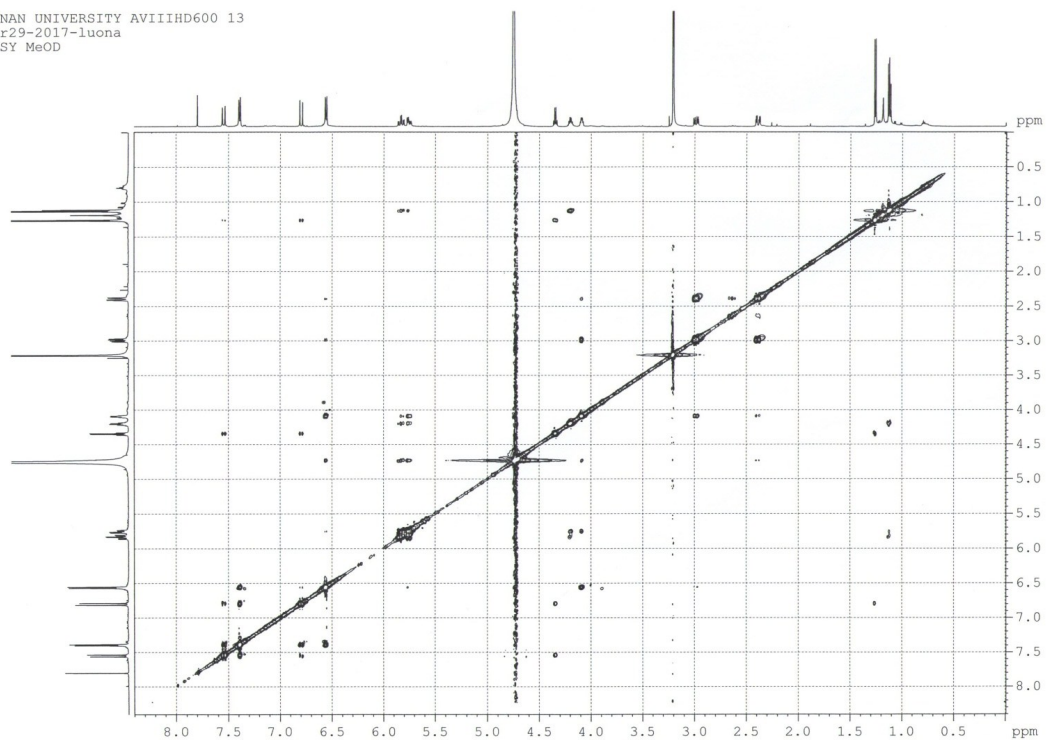


Figure S6. ROESY spectrum of compound (1) in MeOD.

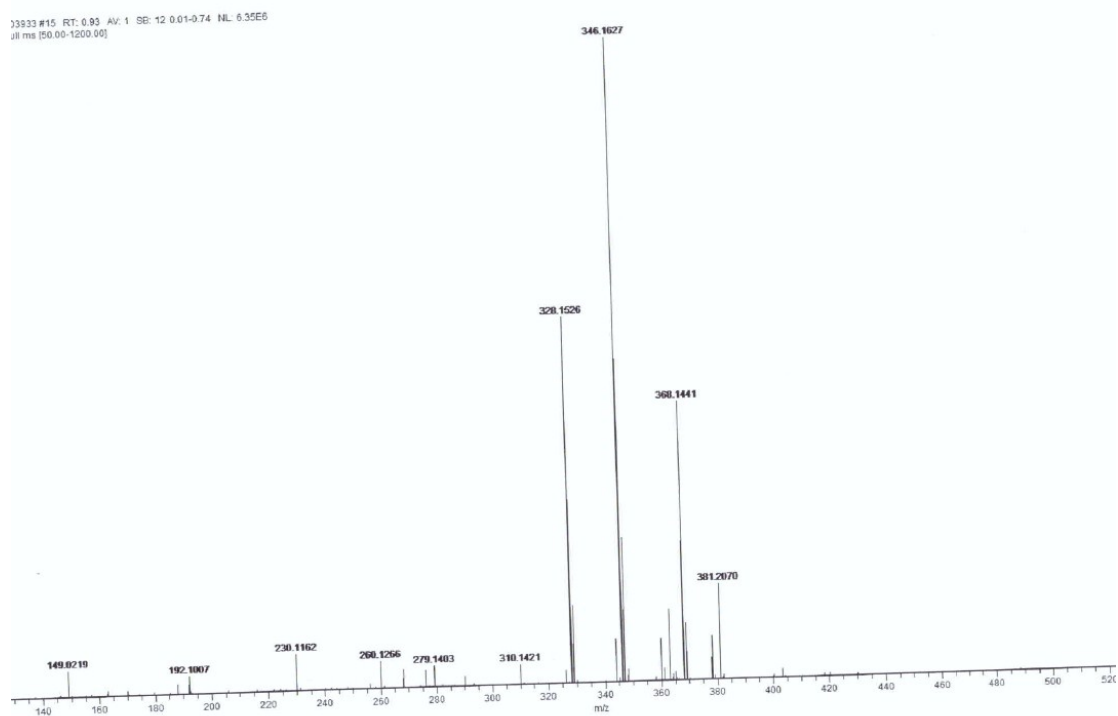


Figure S7. HR ESI-MS spectrum of compound (1) .

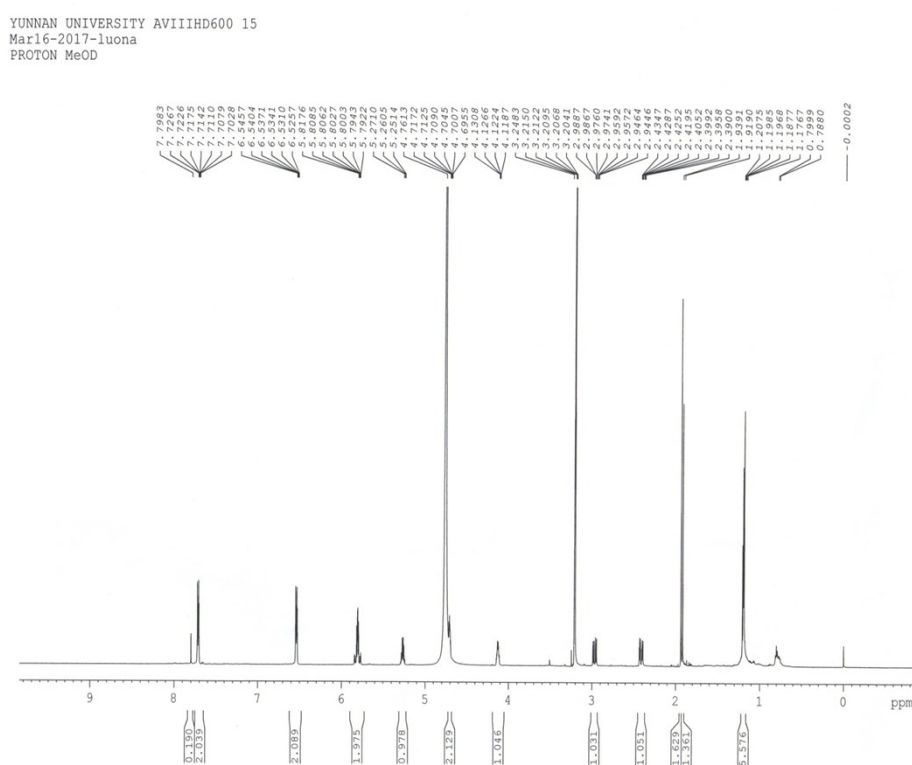


Figure S8. ^1H NMR spectrum of compound (2) in MeOD.

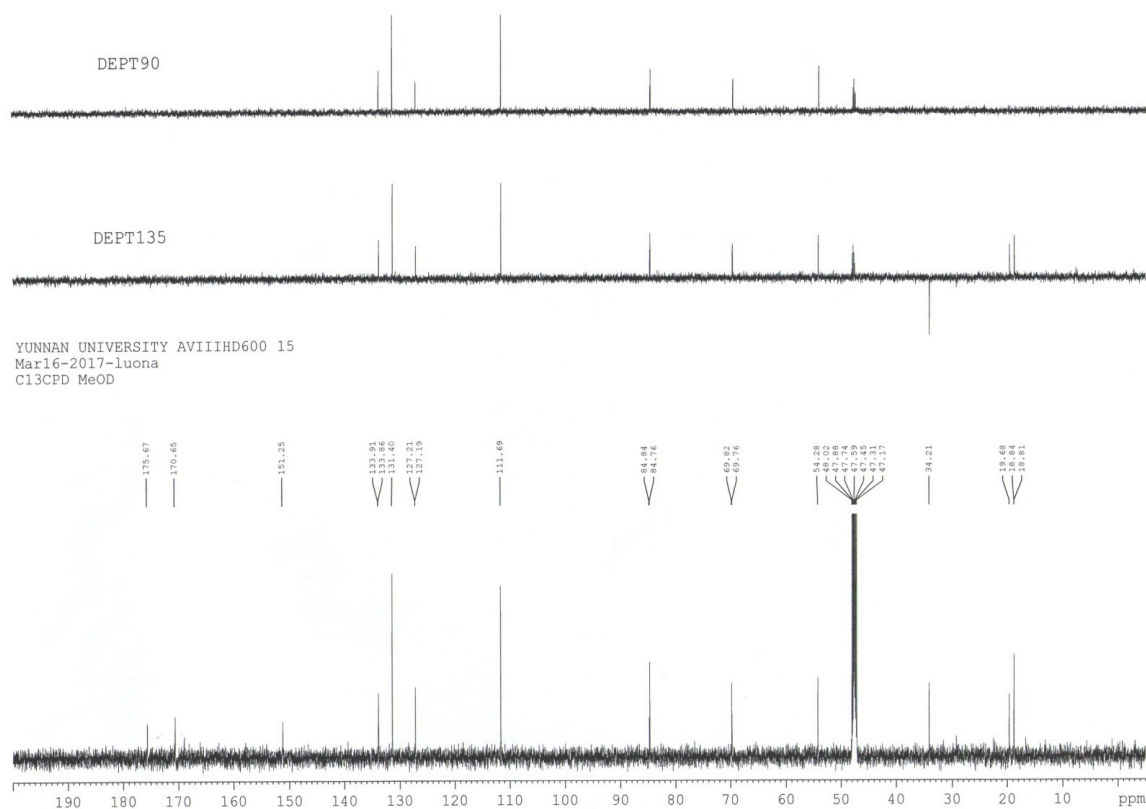


Figure S9. ^{13}C NMR spectrum of compound (2) in MeOD.

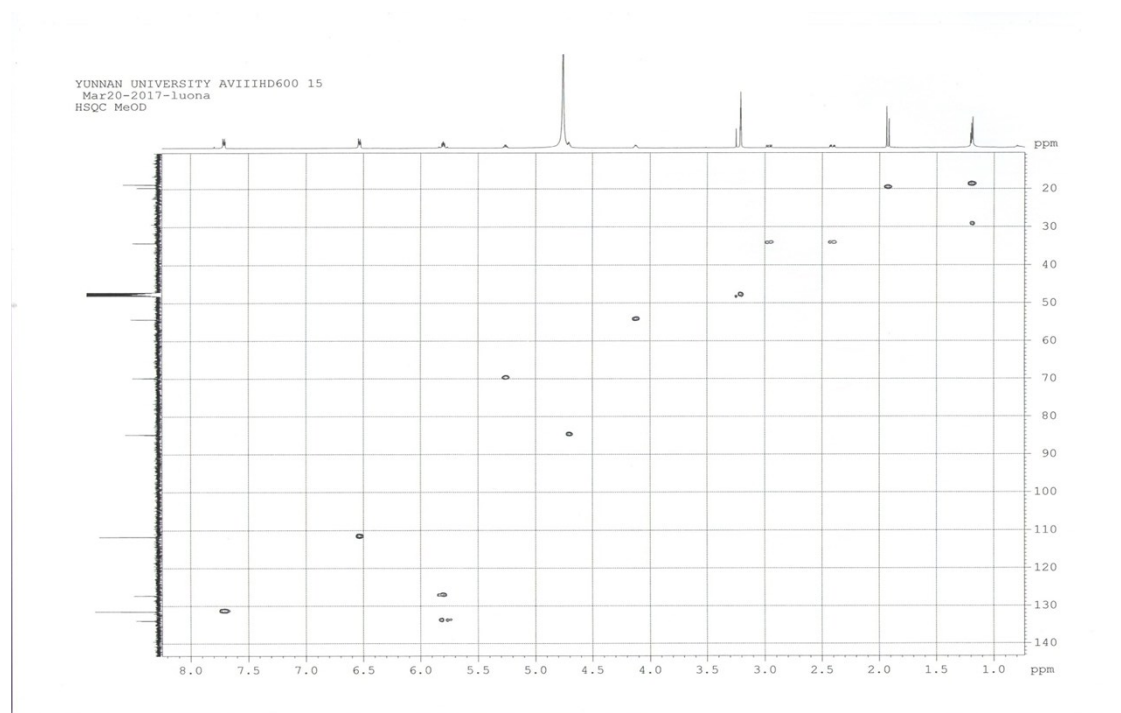


Figure S10. HSQC spectrum of compound (2) in MeOD

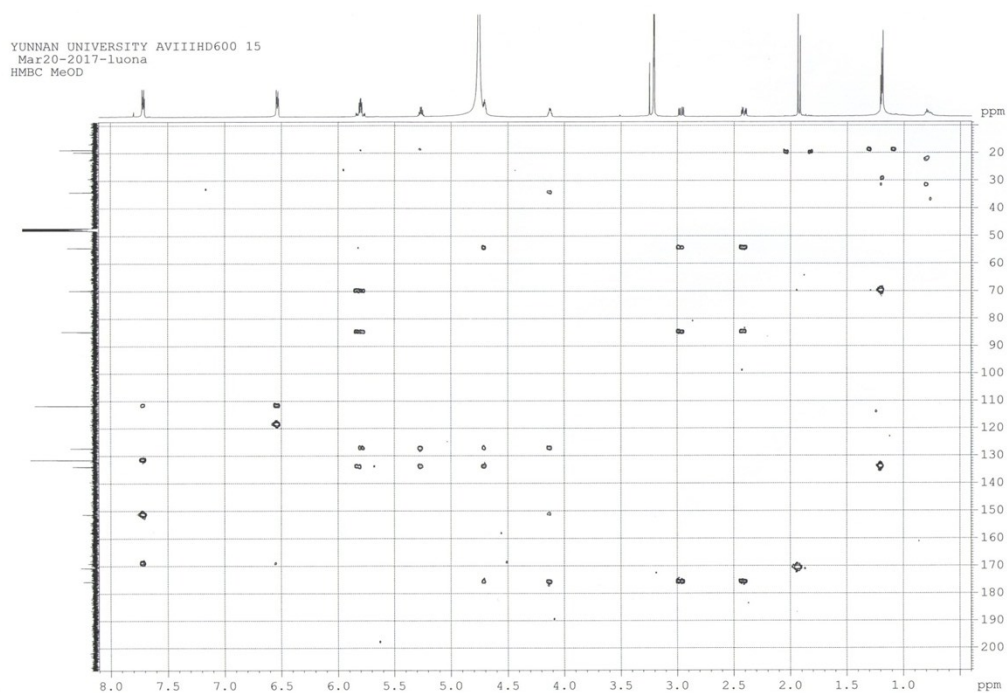


Figure S11. HMBC spectrum of compound (2) in MeOD.

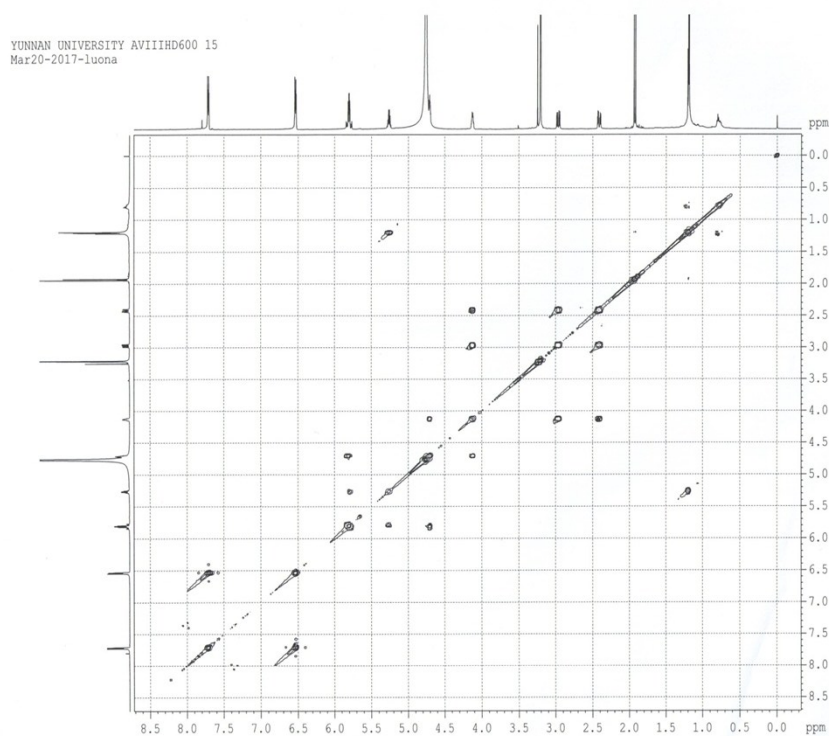


Figure S12. ^1H - ^1H COSY spectrum of compound (2) in MeOD.

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Mar20-2017-luona

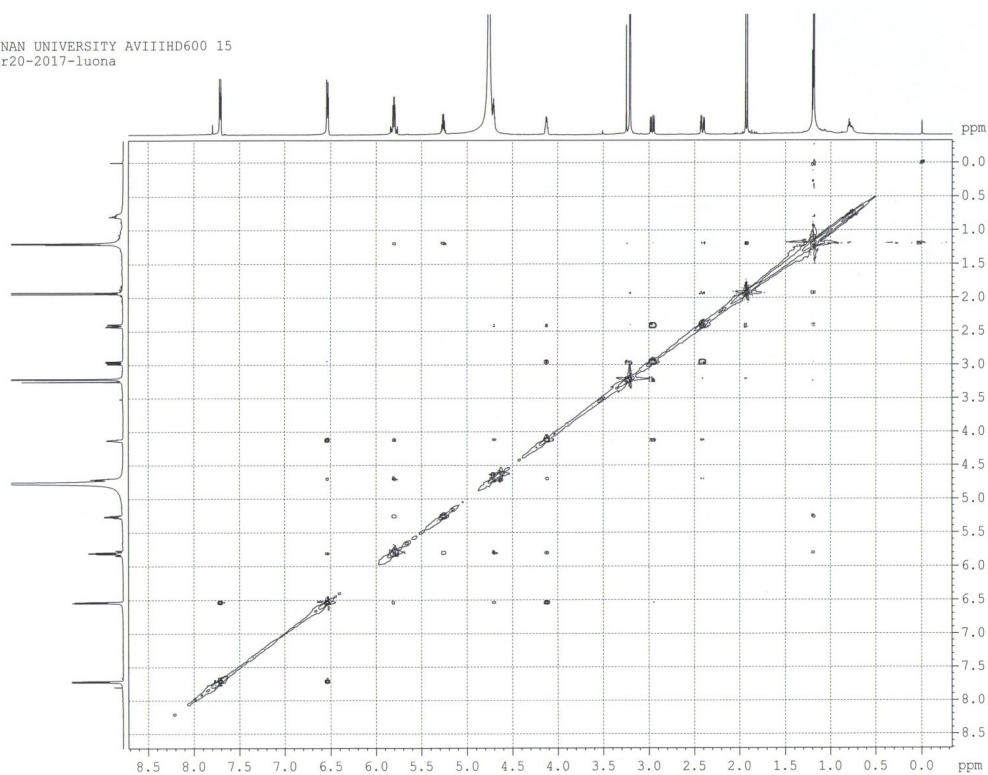


Figure S13. ROESY spectrum of compound (2) in MeOD.

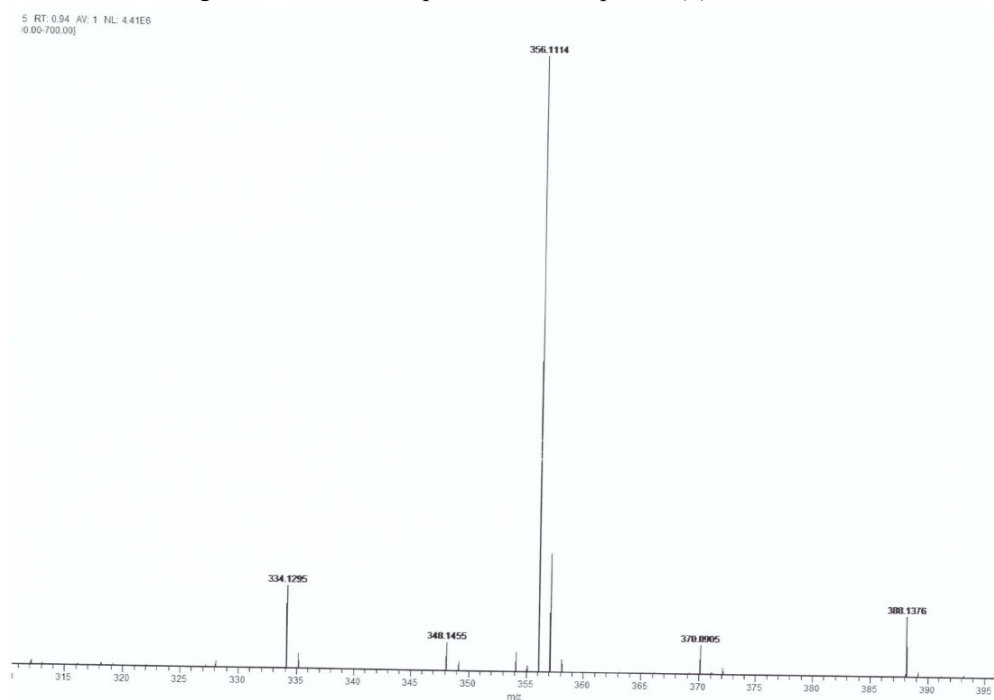


Figure S14. HR ESI-MS spectrum of compound (2) .

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Mar16-2017-luona
PROTON MeOD

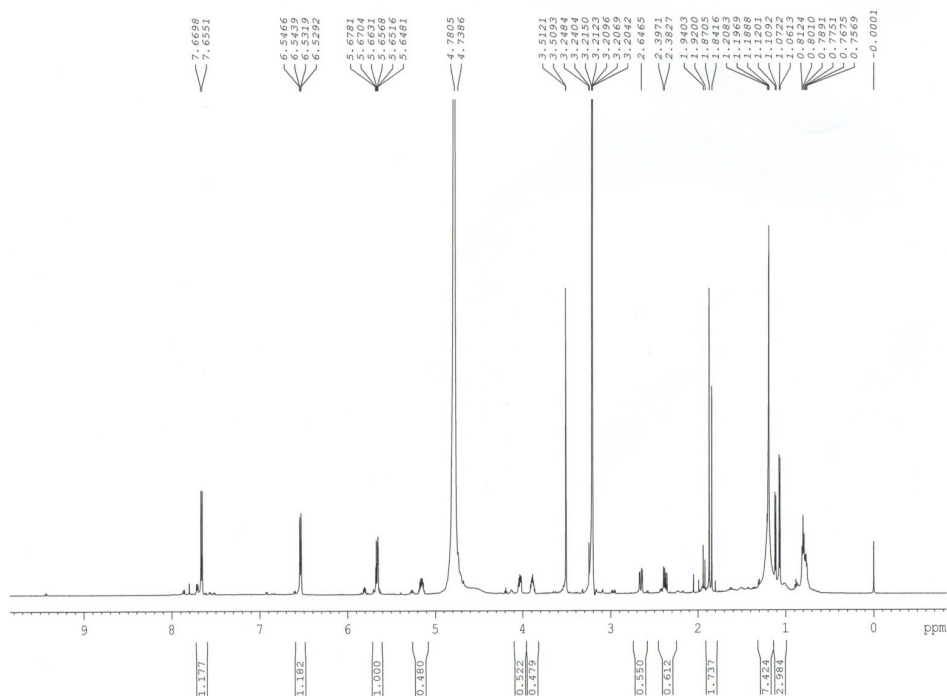


Figure S15. ^1H NMR spectrum of compound (3) in MeOD.

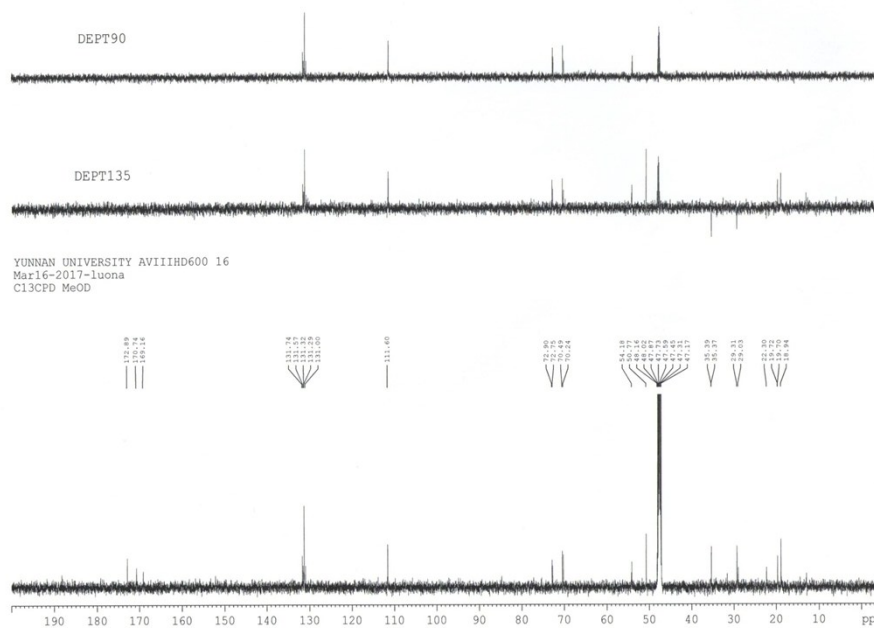


Figure S16. ^{13}C NMR spectrum of compound (3) in MeOD.

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Mar20-2017-luona
HSQC MeOD

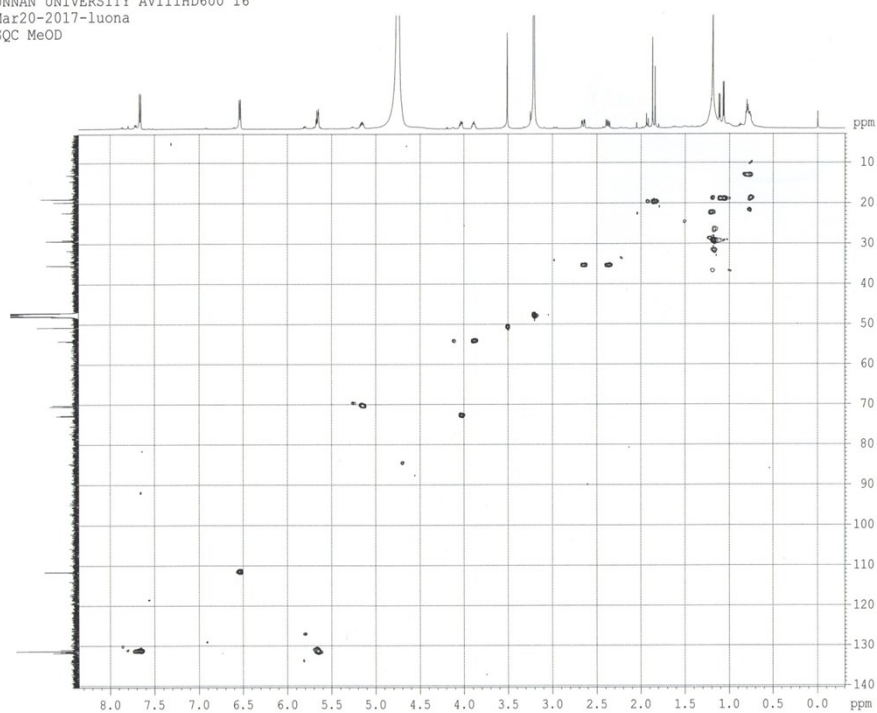


Figure S17. HSQC spectrum of compound (3) in MeOD.

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HMBC MeOD

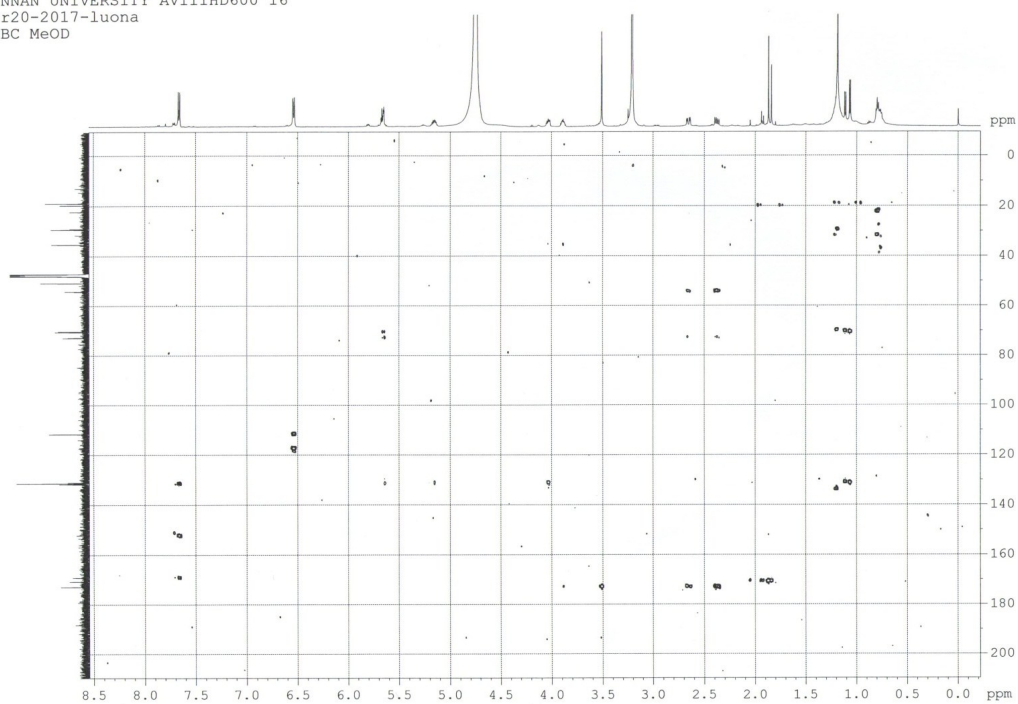


Figure S18. HMBC spectrum of compound (3) in MeOD.

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Mar20-2017-luona
COSY MeO

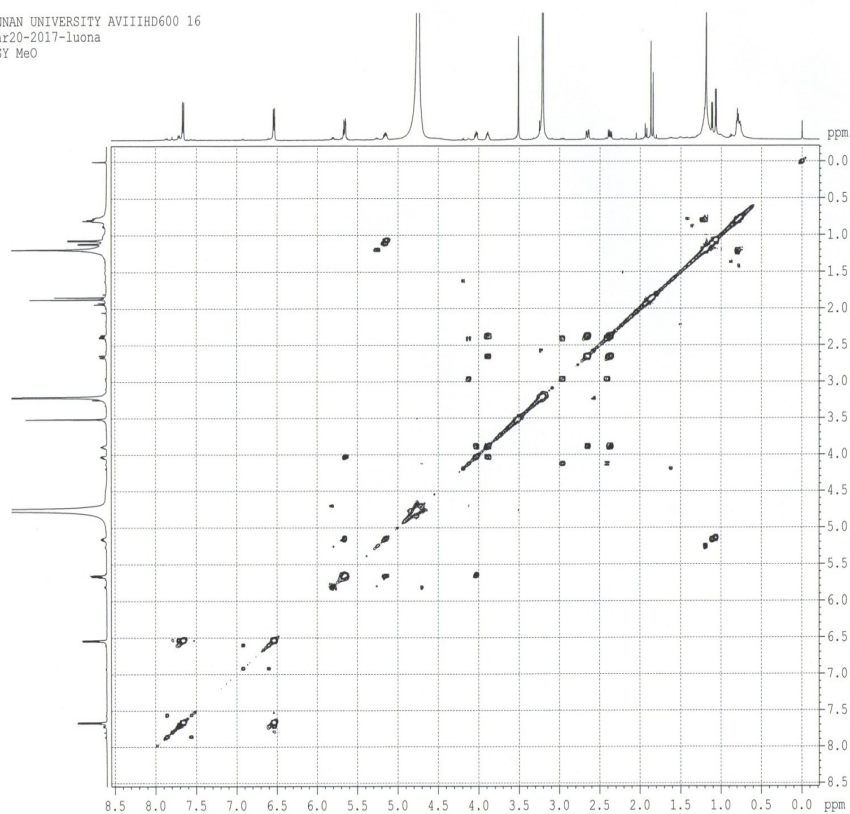


Figure S19. ^1H - ^1H COSY spectrum of compound (**3**) in MeOD.

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Mar20-2017-luona
ROESY MeOD

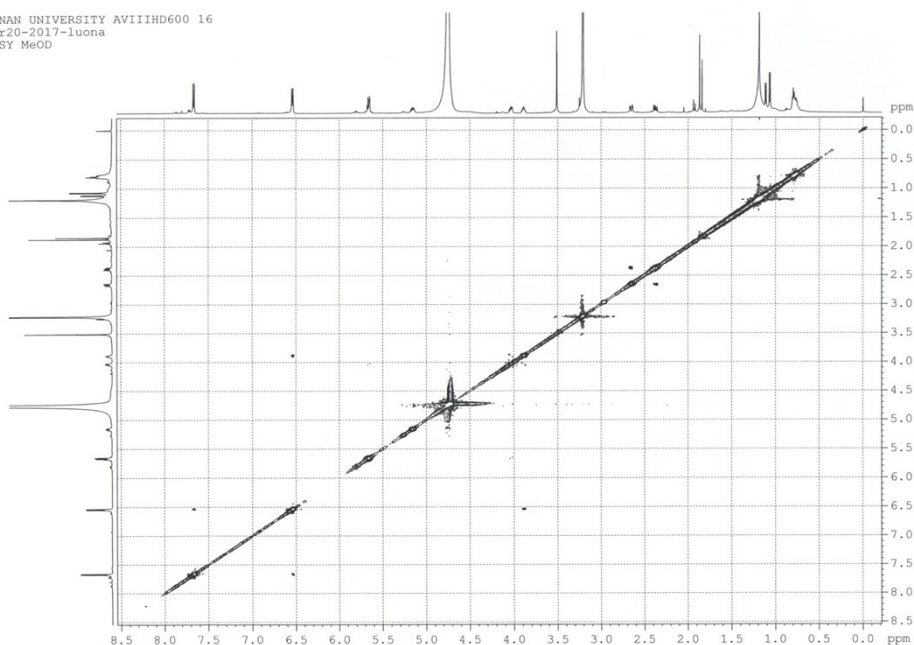


Figure S20. ROESY spectrum of compound (**3**) in MeOD.

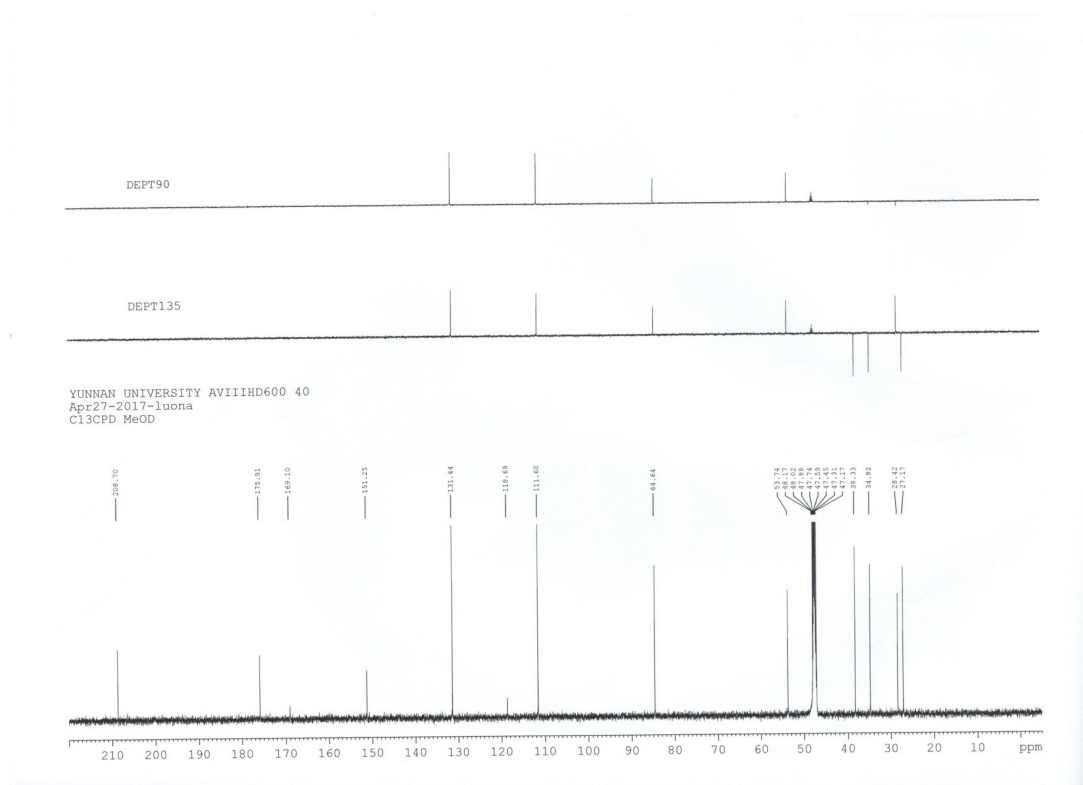


Figure S23. ^{13}C NMR spectrum of compound (4) in MeOD.

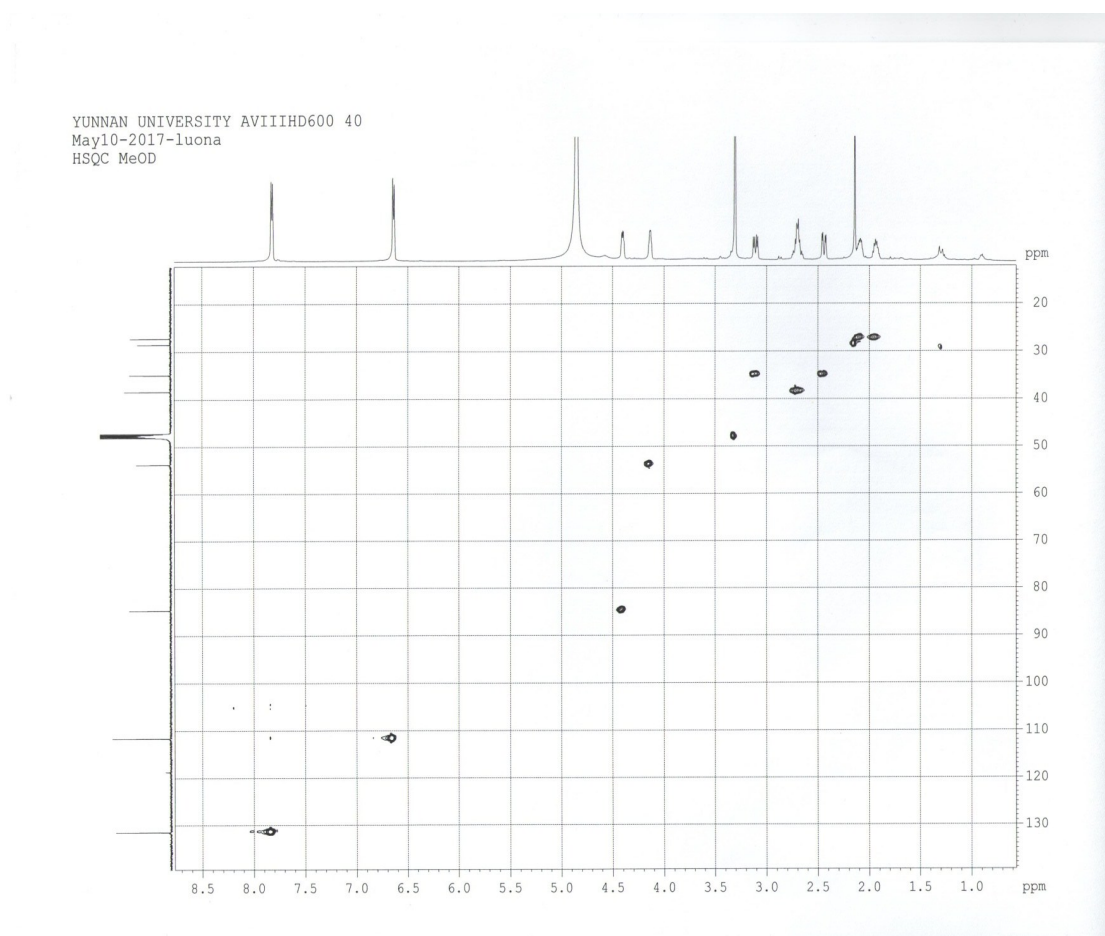


Figure S24. HSQC spectrum of compound (4) in MeOD.

YUNNAN UNIVERSITY AVIIHD600 40
May10-2017-luona
HMBC MeOD

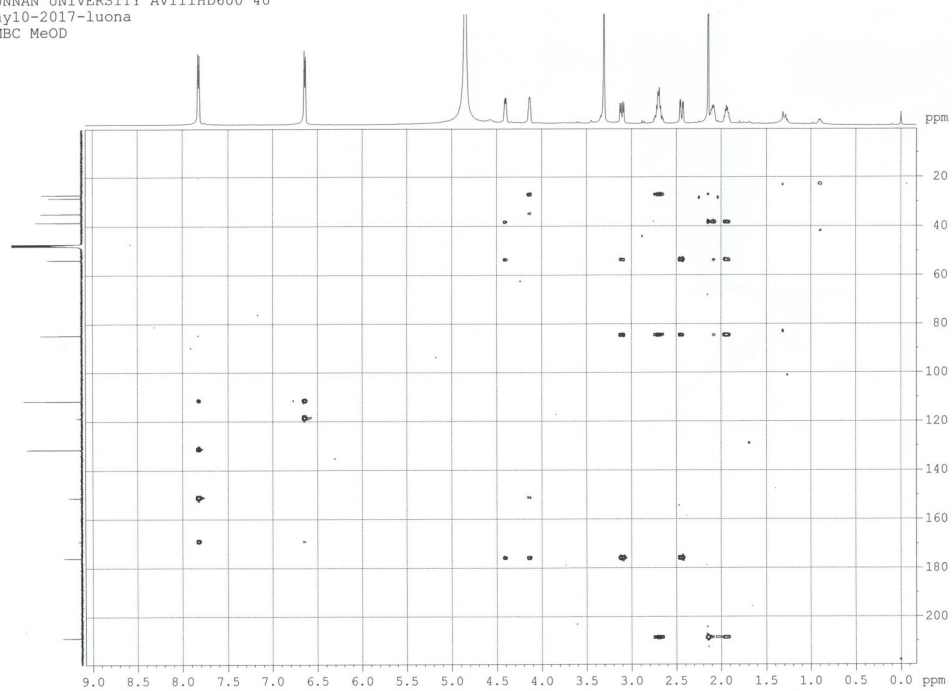


Figure S25. HMBC spectrum of compound (4) in MeOD.

YUNNAN UNIVERSITY AVIIHD600 40
May10-2017-luona
COSY MeOD

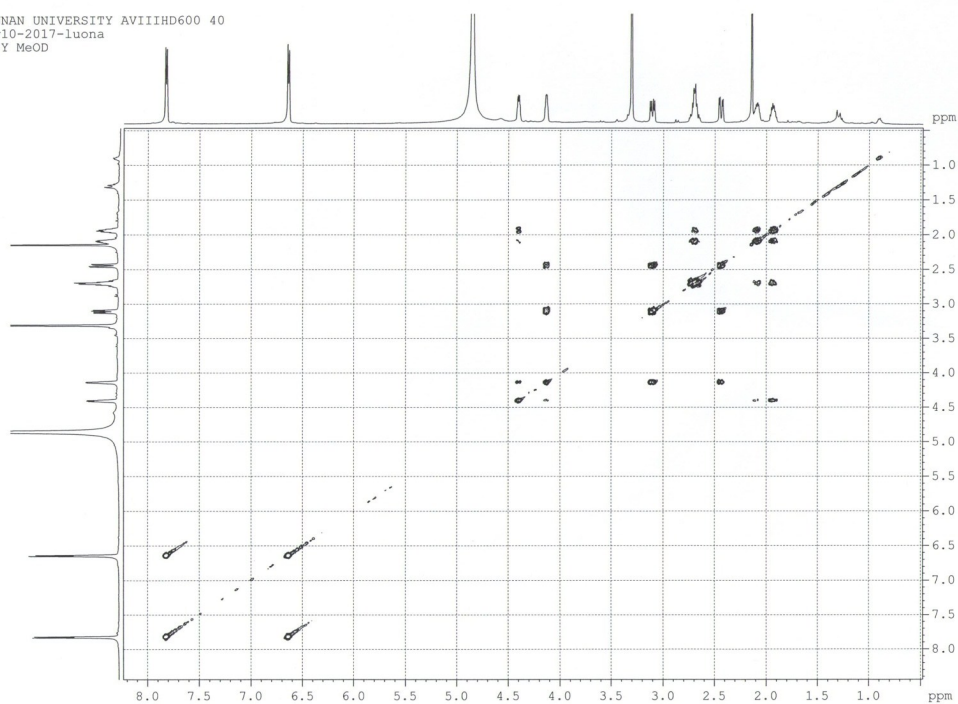


Figure S26. ^1H - ^1H COSY spectrum of compound (4) in MeOD.

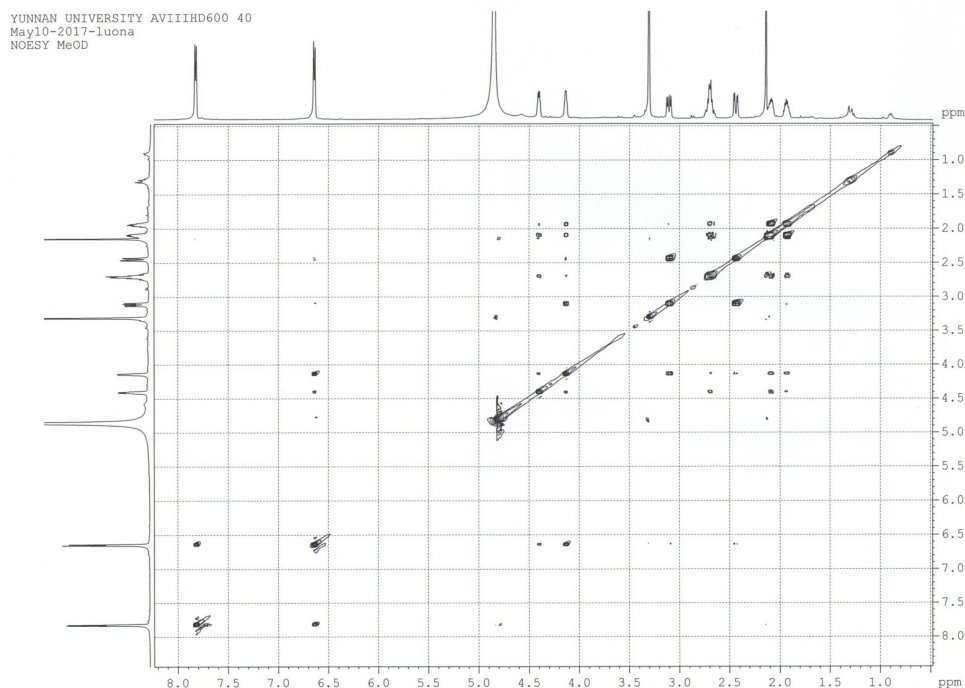


Figure S27. NOESY spectrum of compound (4) in MeOD

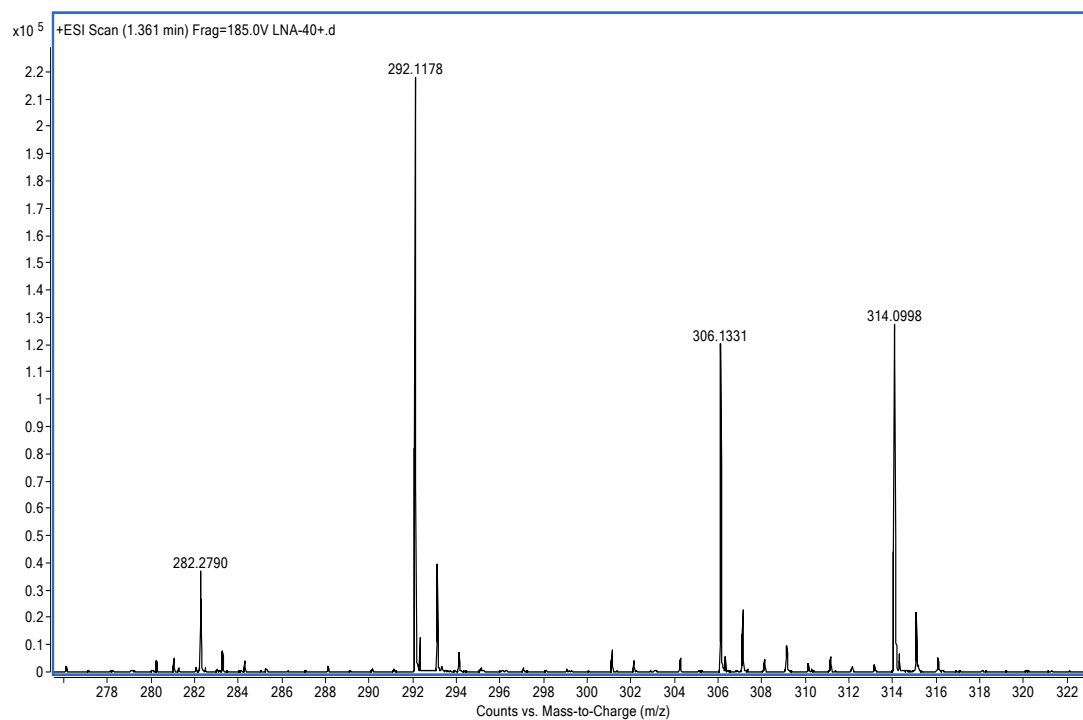


Figure S28. HR ESI-MS spectrum of compound (4) .

YUNNAN UNIVERSITY AVIIHD600 37
Apr28-2017-luona
HSQC MeOD

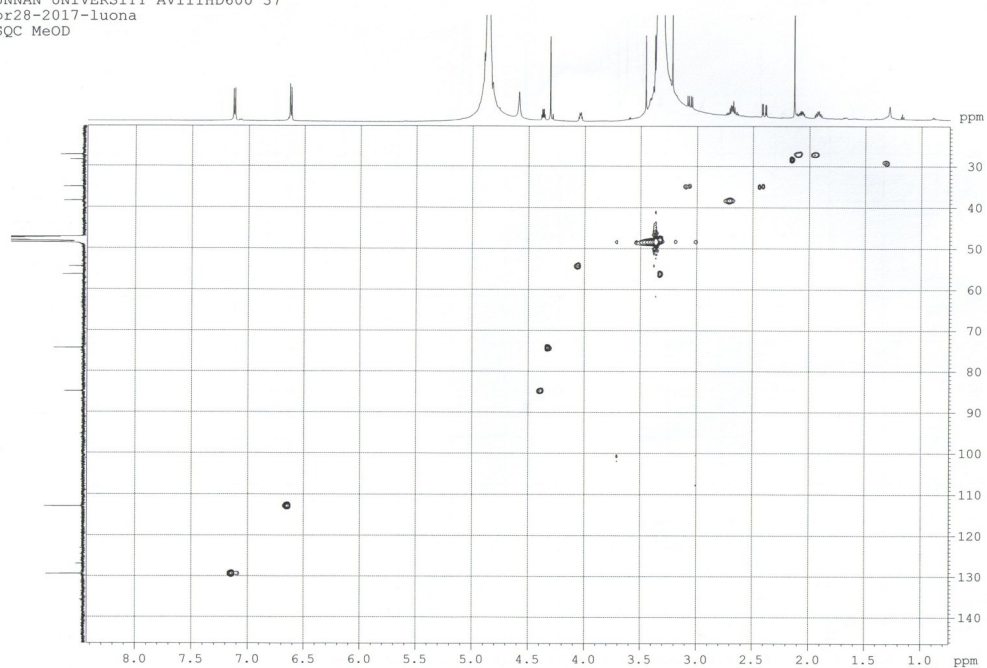


Figure S31. HSQC spectrum of compound (5) in MeOD.

YUNNAN UNIVERSITY AVIIHD600 37
Apr28-2017-luona
HMBC MeOD

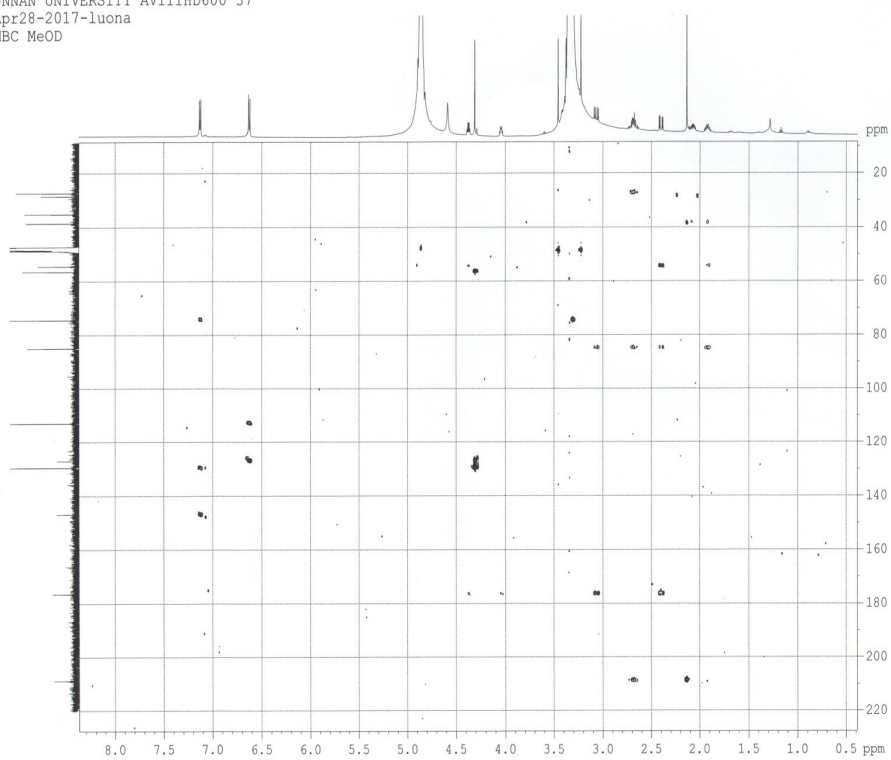


Figure S32. HMBC spectrum of compound (5) in MeOD.

YUNNAN UNIVERSITY AVIIHD600 37
May10-2017-luona
COSY MeOD

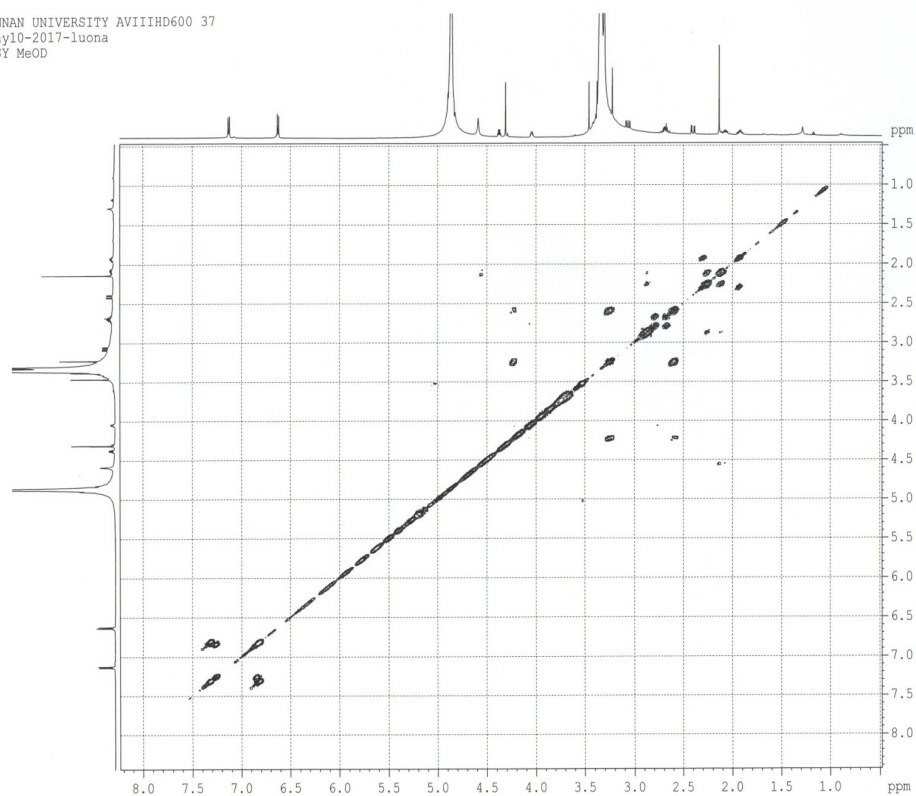


Figure S33. ¹H-¹H COSY spectrum of compound (5) in MeOD.

YUNNAN UNIVERSITY AVIIHD600 37
Apr28-2017-luona
ROESY MeOD

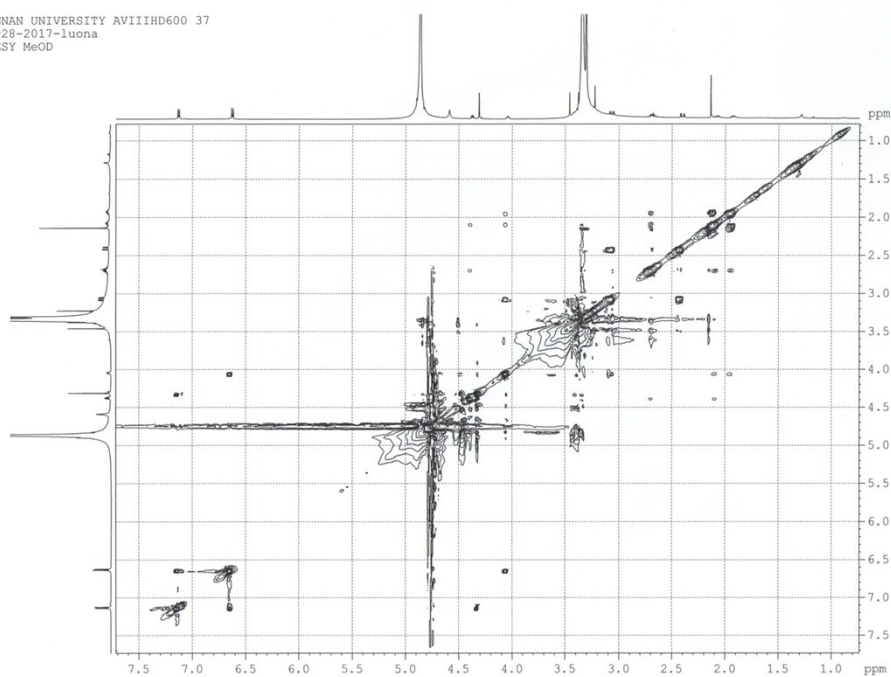


Figure S34. NOESY spectrum of compound (5) in MeOD.

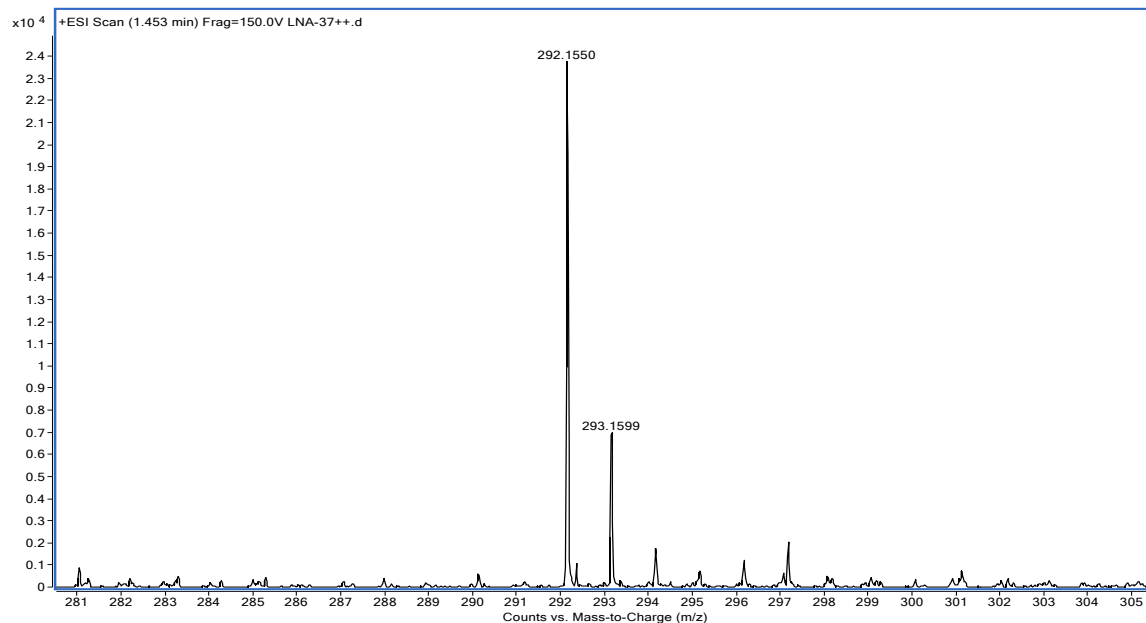


Figure S35. HR ESI-MS spectrum of compound (5) .

YUNNAN UNIVERSITY AVIIHD600 39
Apr27-2017-luona
PROTON MeOD

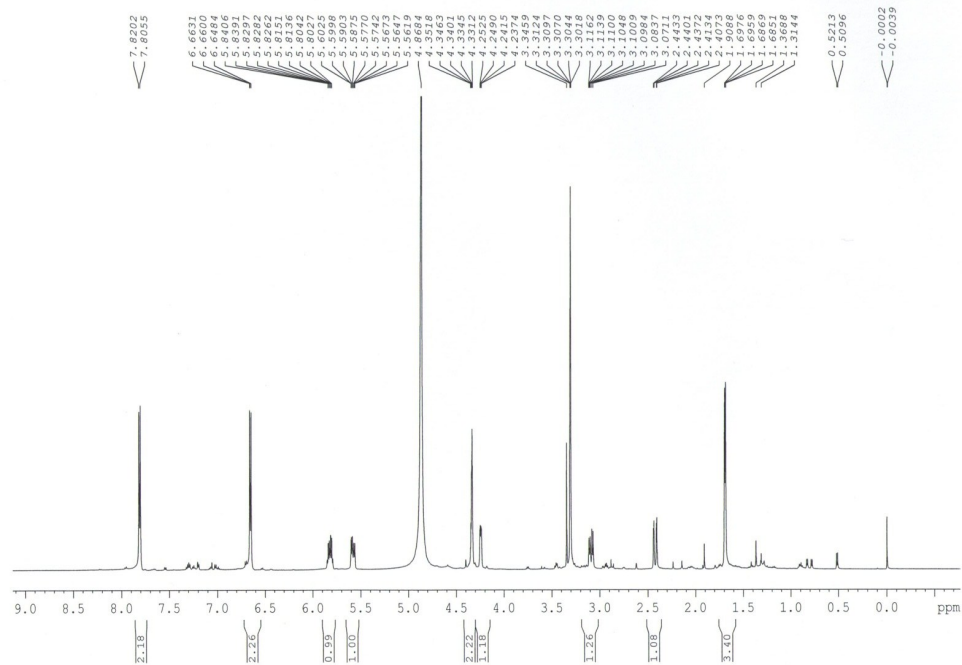


Figure S36. ^1H NMR spectrum of compound (6) in MeOD.

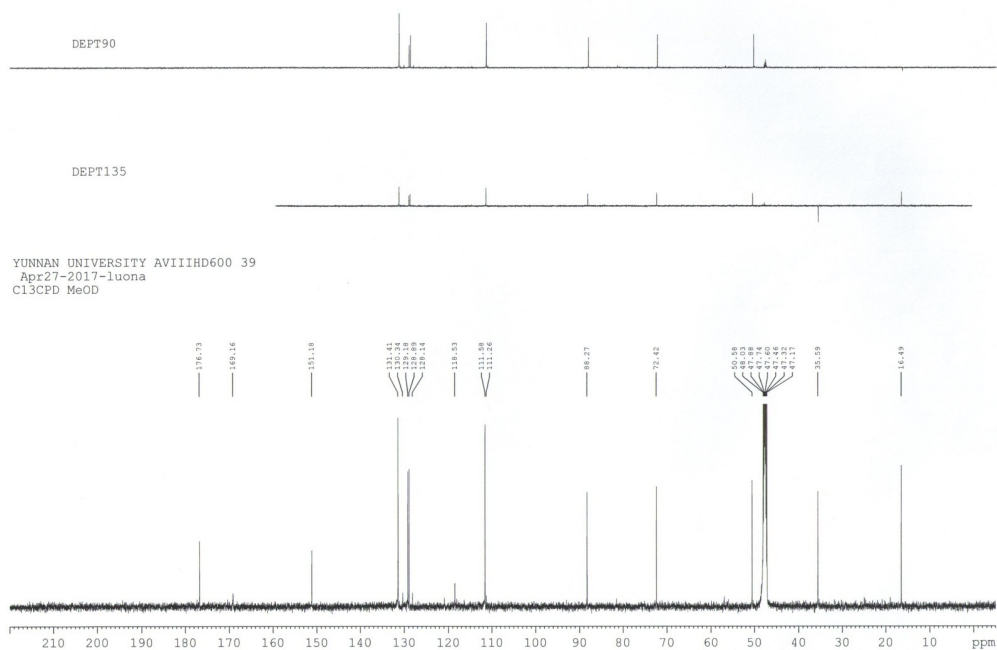


Figure S37. ^{13}C NMR spectrum of compound (6) in MeOD.

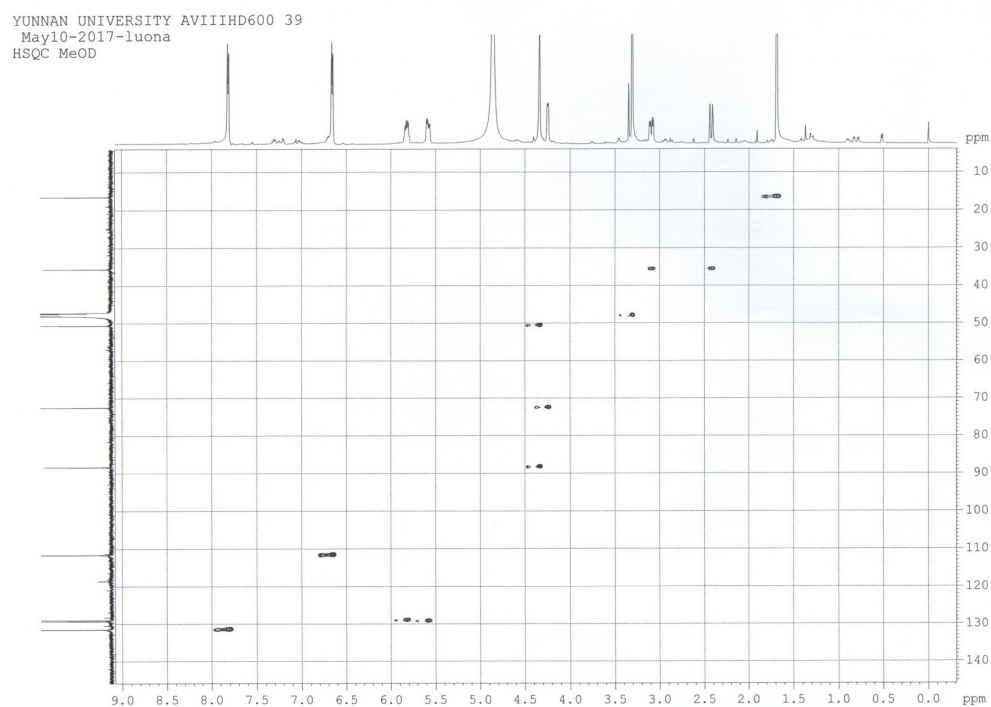


Figure S38. HSQC spectrum of compound (6) in MeOD.

YUNNAN UNIVERSITY AVIIIHD600 39
May10-2017-luona
HMBC MeOD

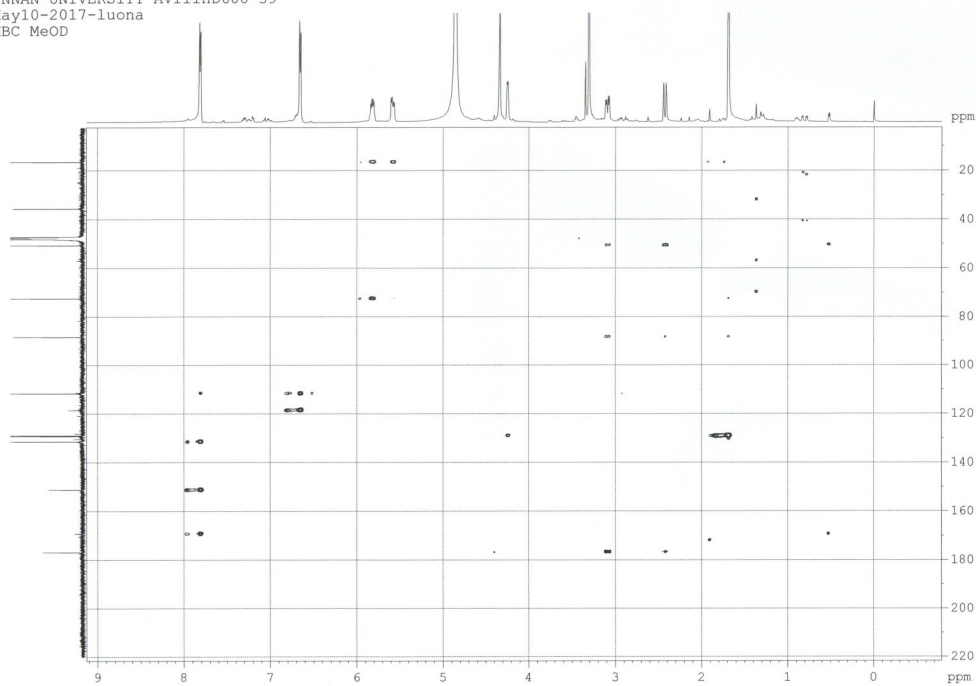


Figure S39. HMBC spectrum of compound (6) in MeOD.

YUNNAN UNIVERSITY AVIIIHD600 39
May10-2017-luona
COSY MeOD

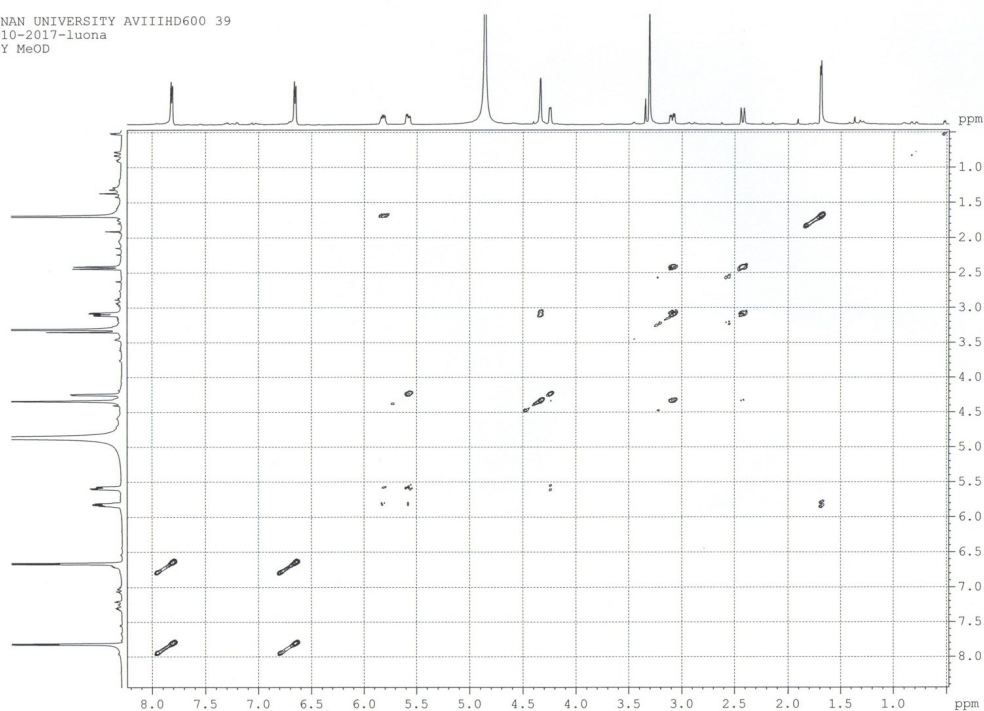


Figure S40. ^1H - ^1H COSY spectrum of compound (6) in MeOD.

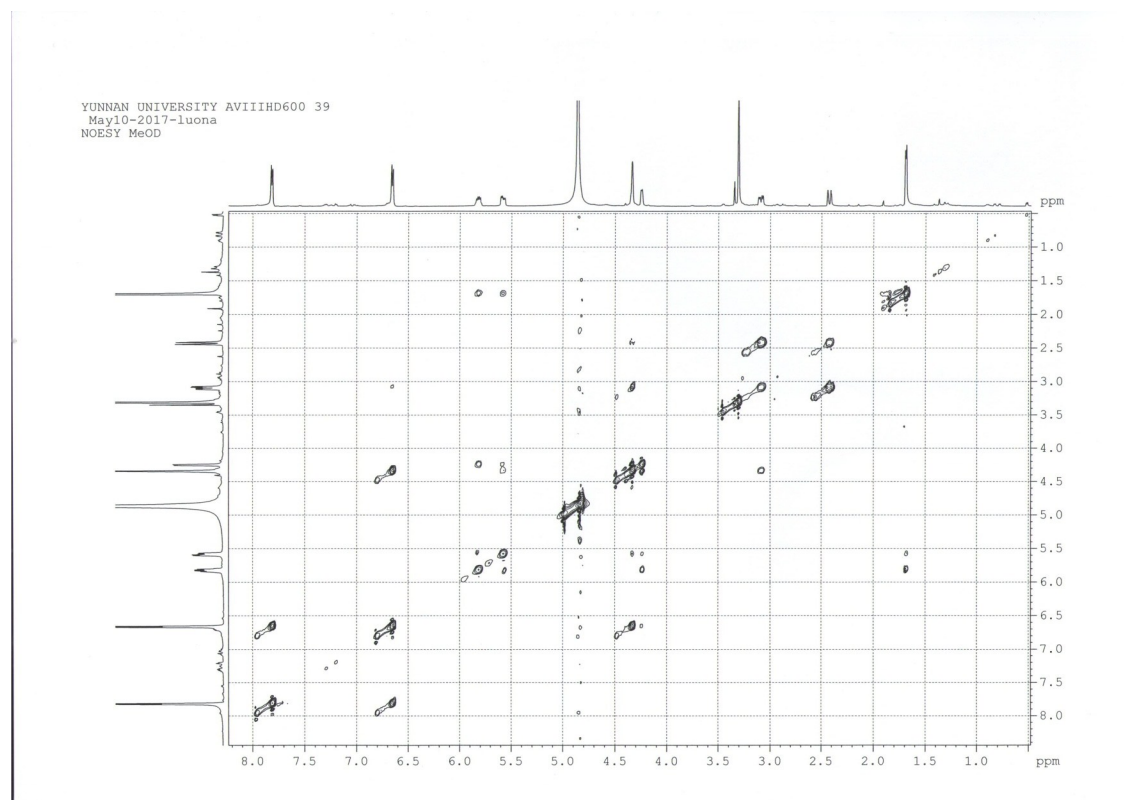


Figure S41. NOESY spectrum of compound (6) in MeOD.

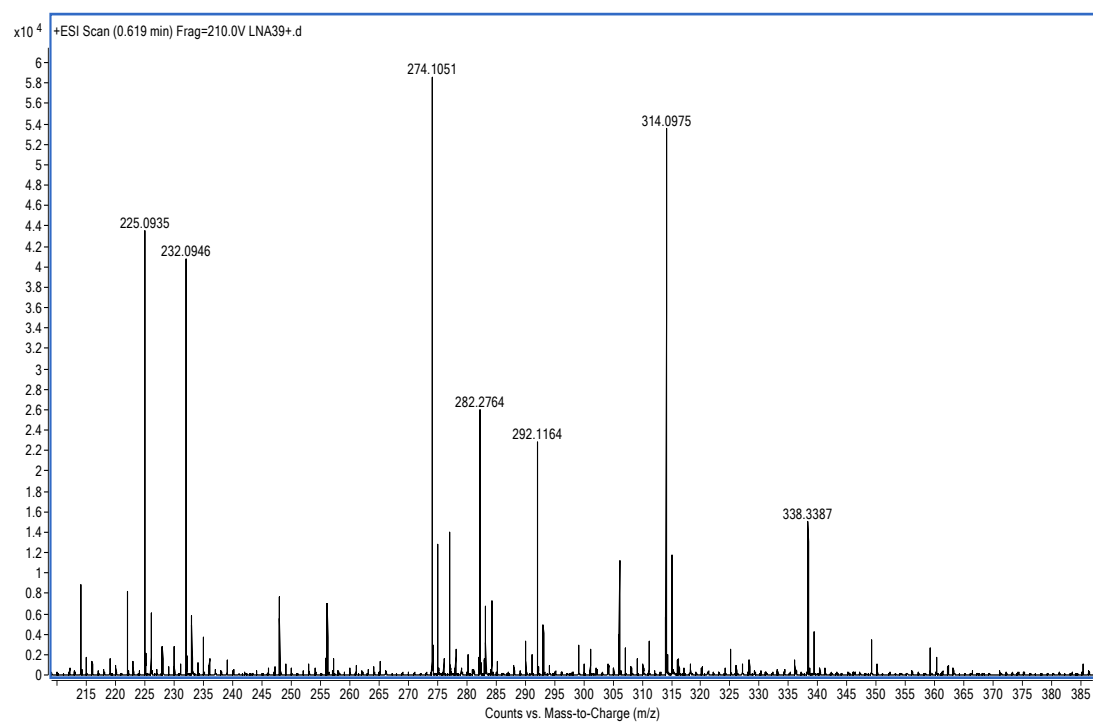


Figure S42. HR ESI-MS spectrum of compound (6) .

YUNNAN UNIVERSITY AVIIHD600 38
May10-2017-luona
HSQC MeOD

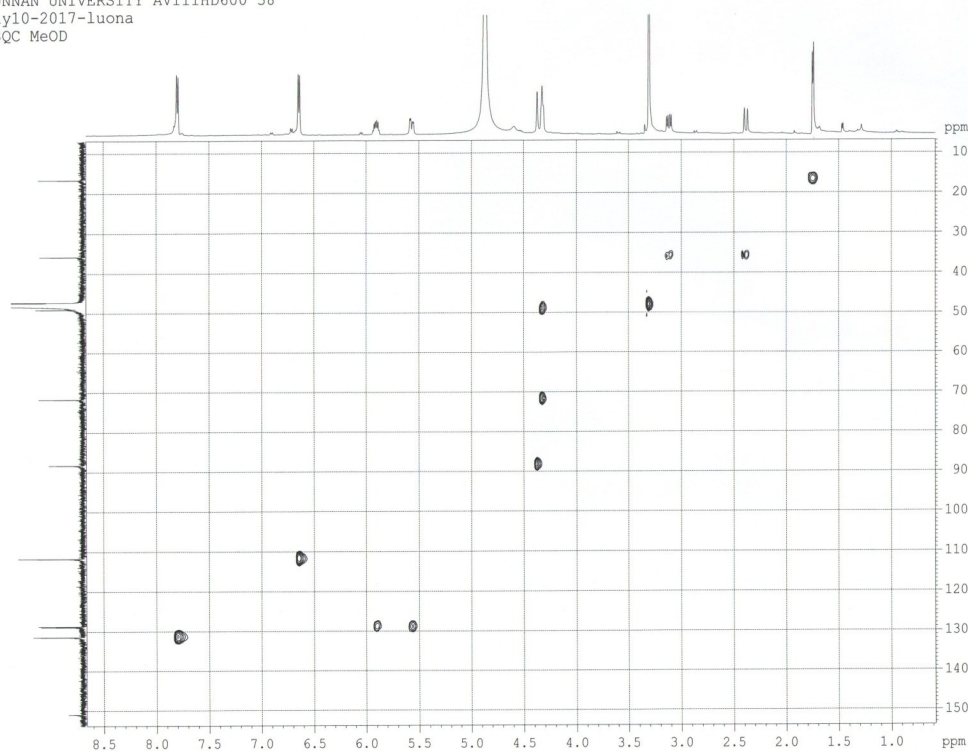


Figure S45. HSQC spectrum of compound (7) in MeOD.

YUNNAN UNIVERSITY AVIIHD600 38
May10-2017-luona
HMBC MeOD

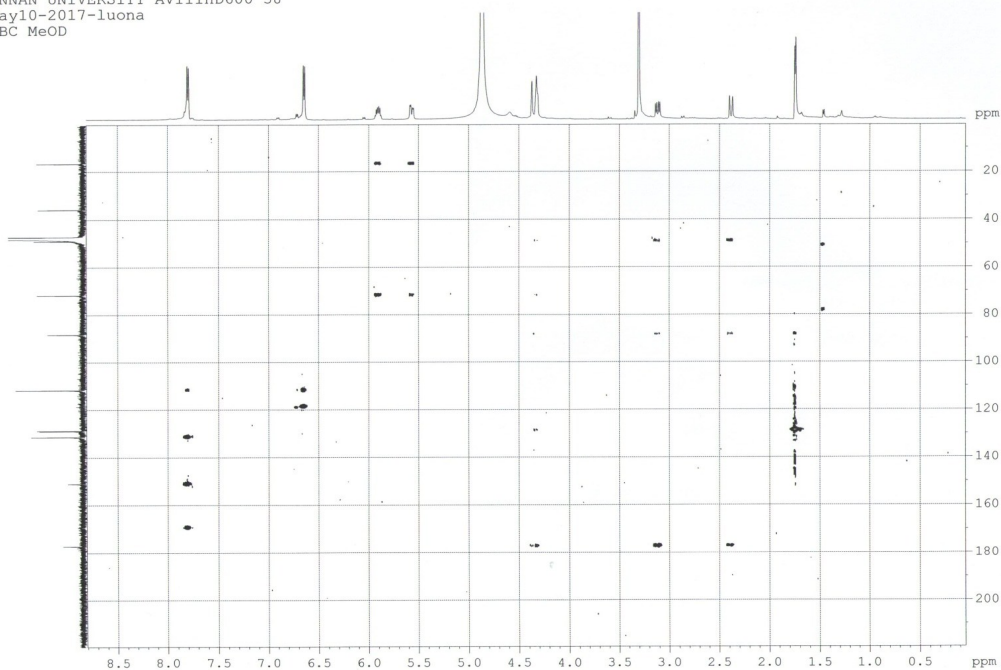


Figure S46. HMBC spectrum of compound (7) in MeOD.

YUNNAN UNIVERSITY AVIIHD600 38
May10-2017-luona
COSY MeOD

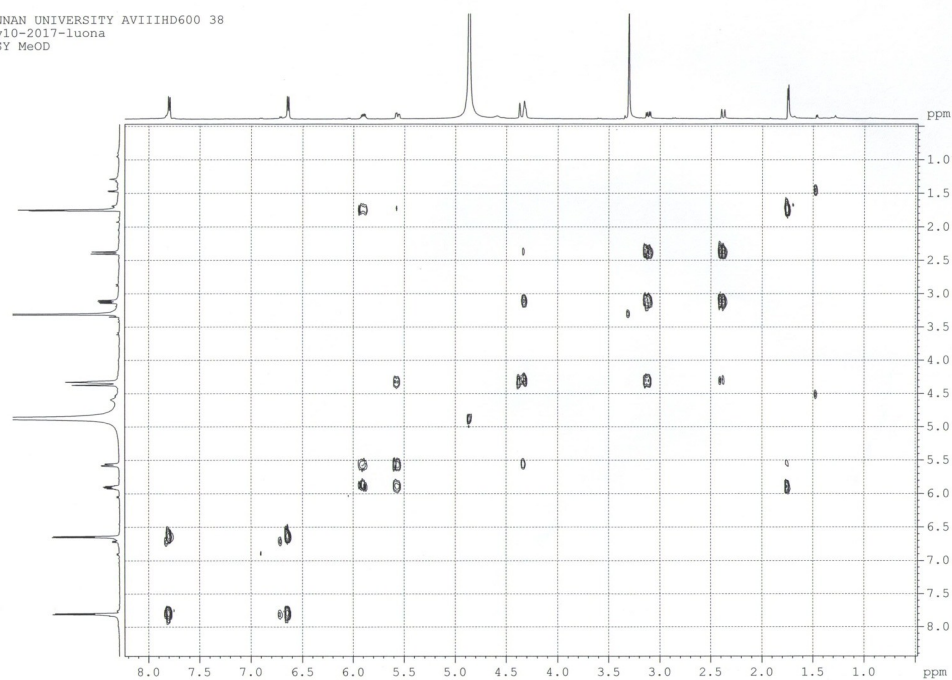


Figure S47. ^1H - ^1H COSY spectrum of compound (7) in MeOD.

YUNNAN UNIVERSITY AVIIHD600 38
May10-2017-luona
NOESY MeOD

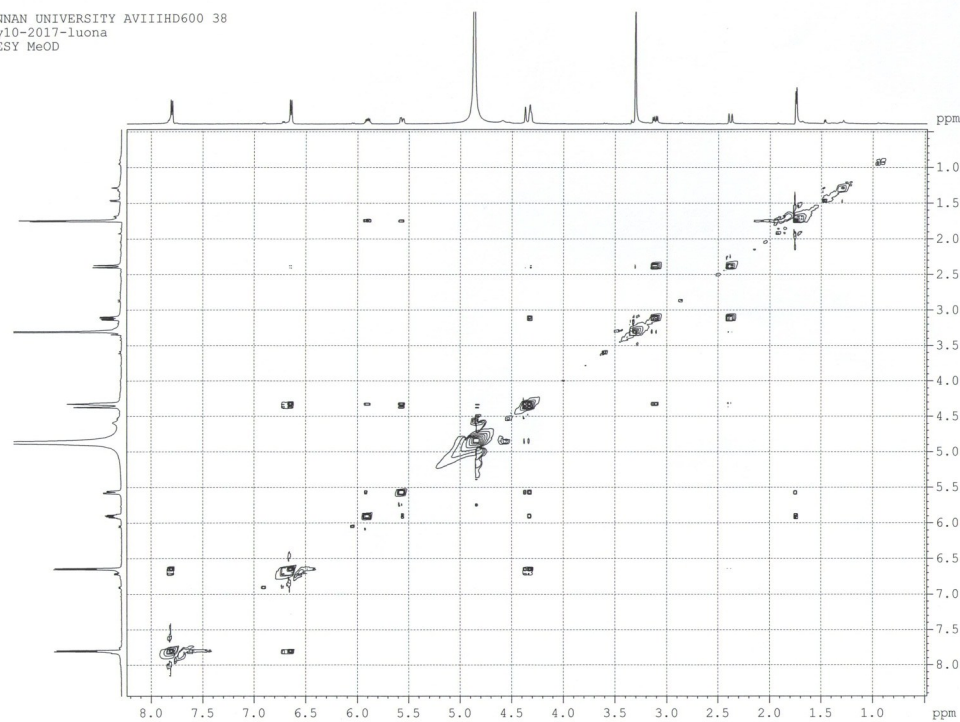


Figure S48. NOESY spectrum of compound (7) in MeOD.

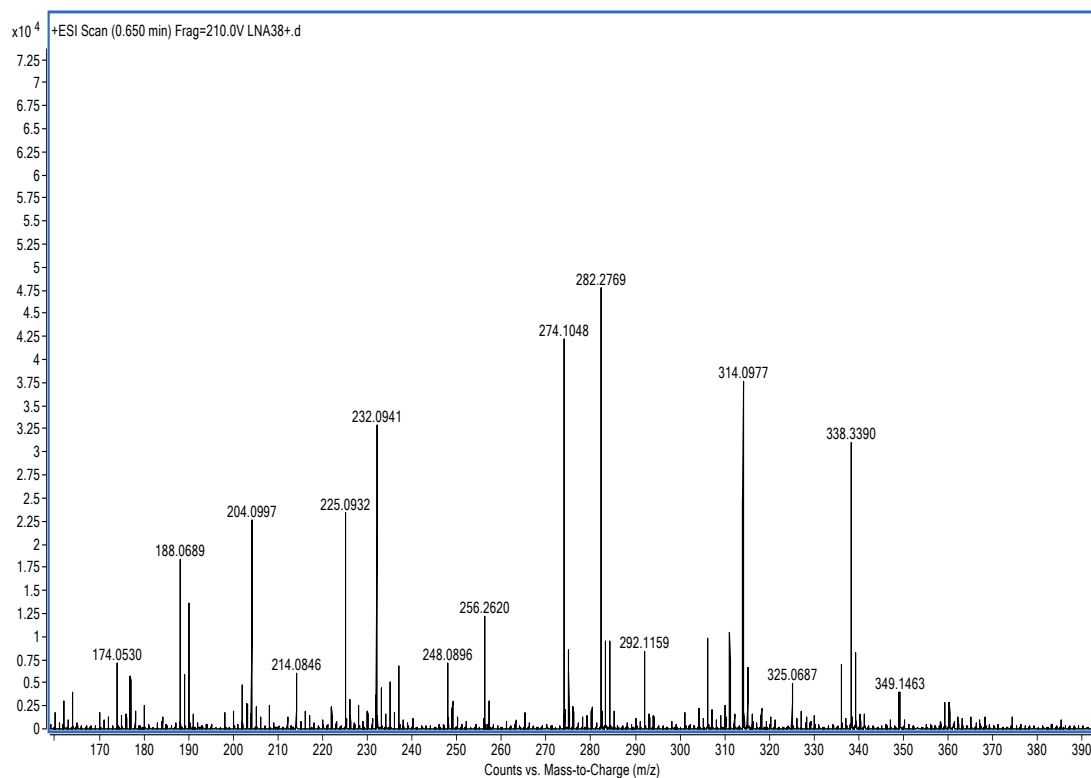


Figure S49. HR ESI-MS spectrum of compound (7) .

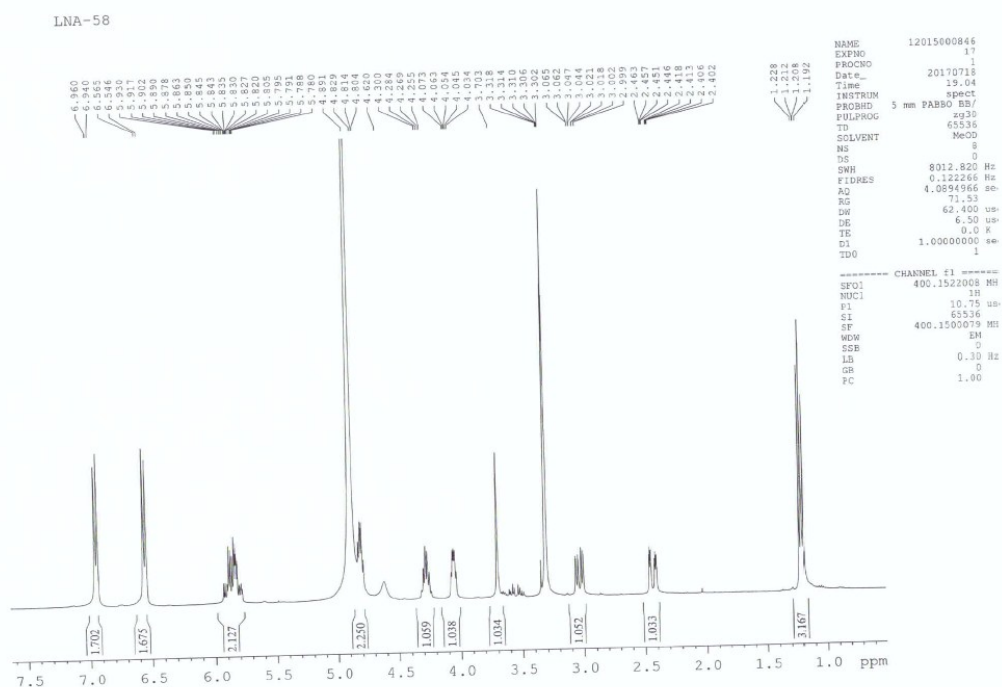


Figure S50. ¹H NMR spectrum of compound (8) in MeOD.

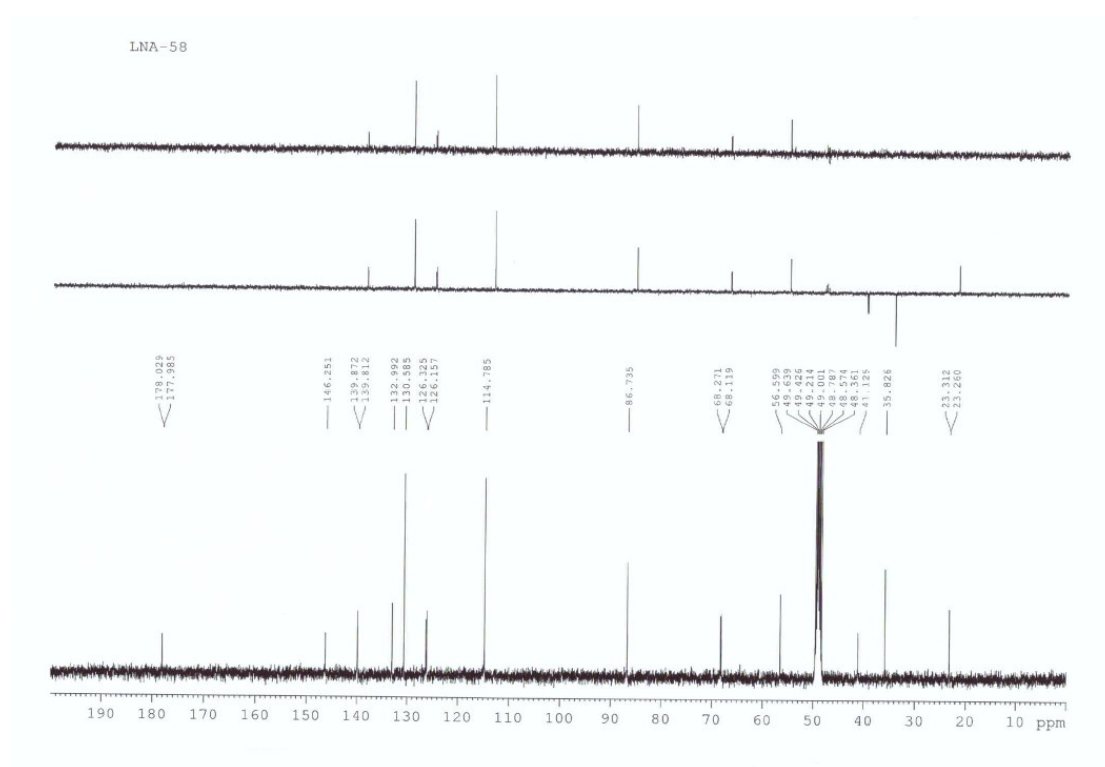


Figure S51. ^{13}C NMR spectrum of compound (**8**) in MeOD.

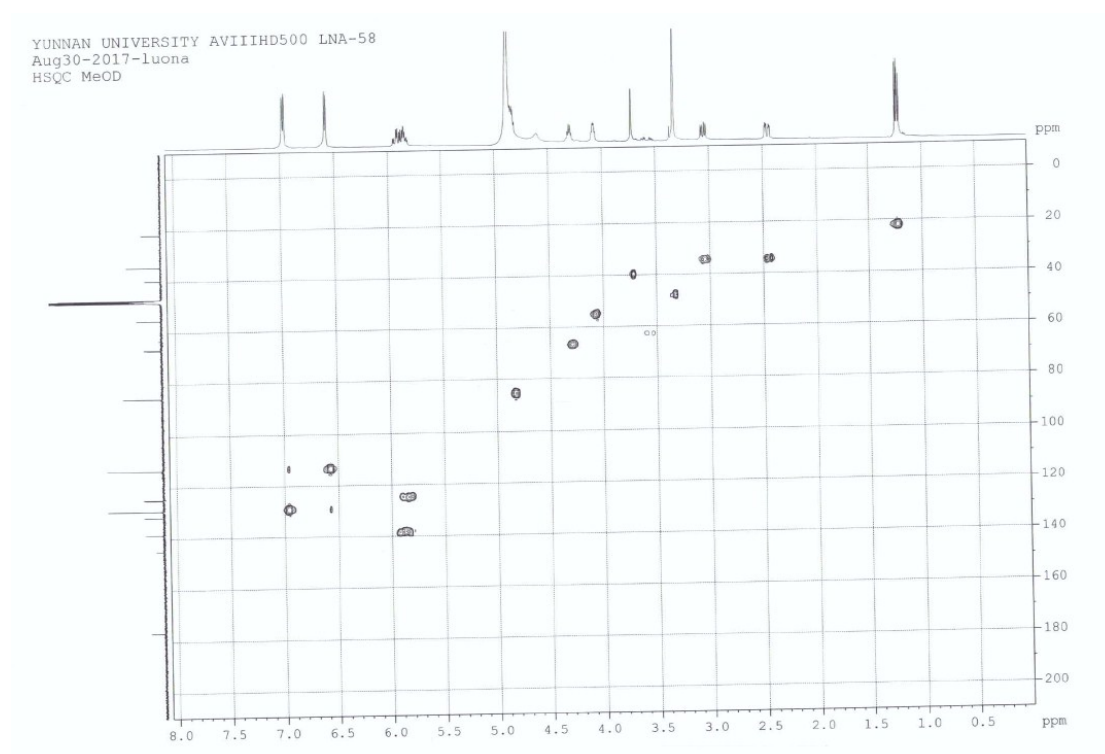


Figure S52. HSQC spectrum of compound (**8**) in MeOD.

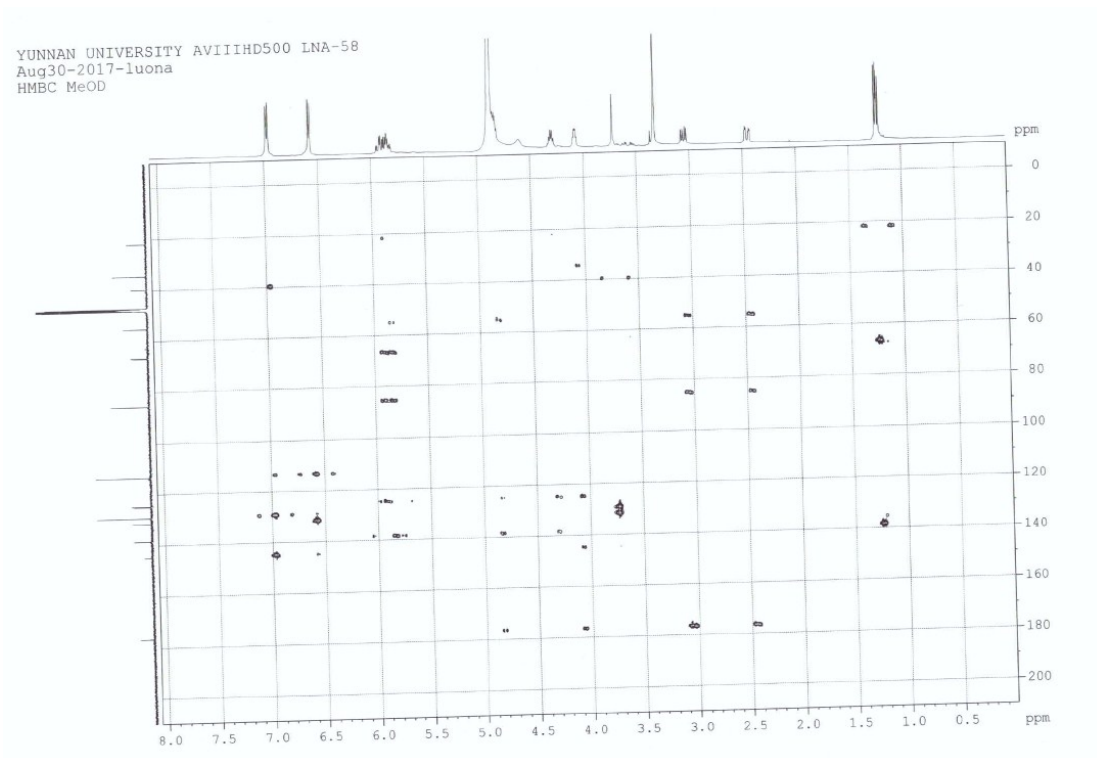


Figure S53. HMBC spectrum of compound (**8**) in MeOD.

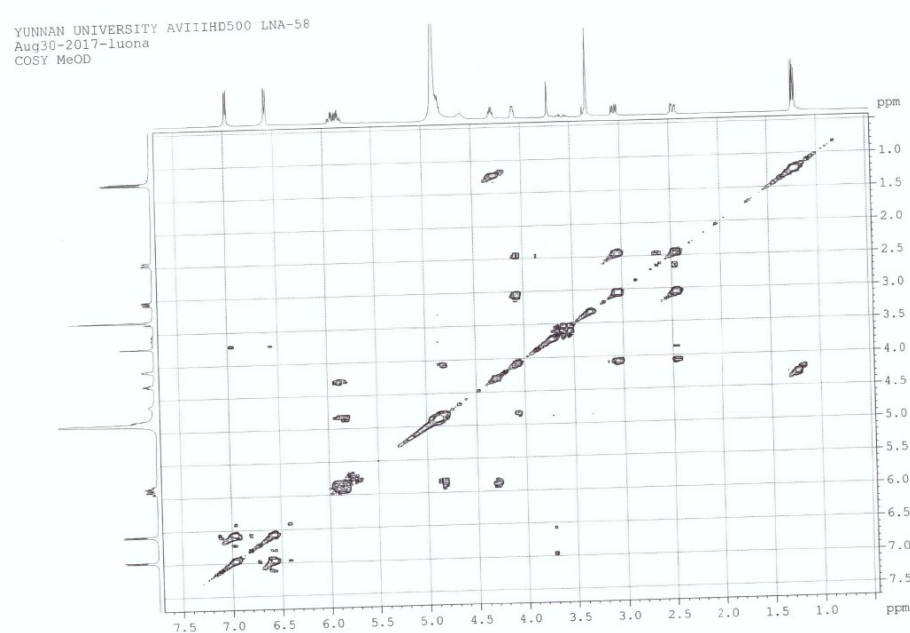


Figure S54. ^1H - ^1H COSY spectrum of compound (**8**) in MeOD.

YUNNAN UNIVERSITY AVIIHD500 LNA-58
Aug30-2017-luona
NOESY MeOD

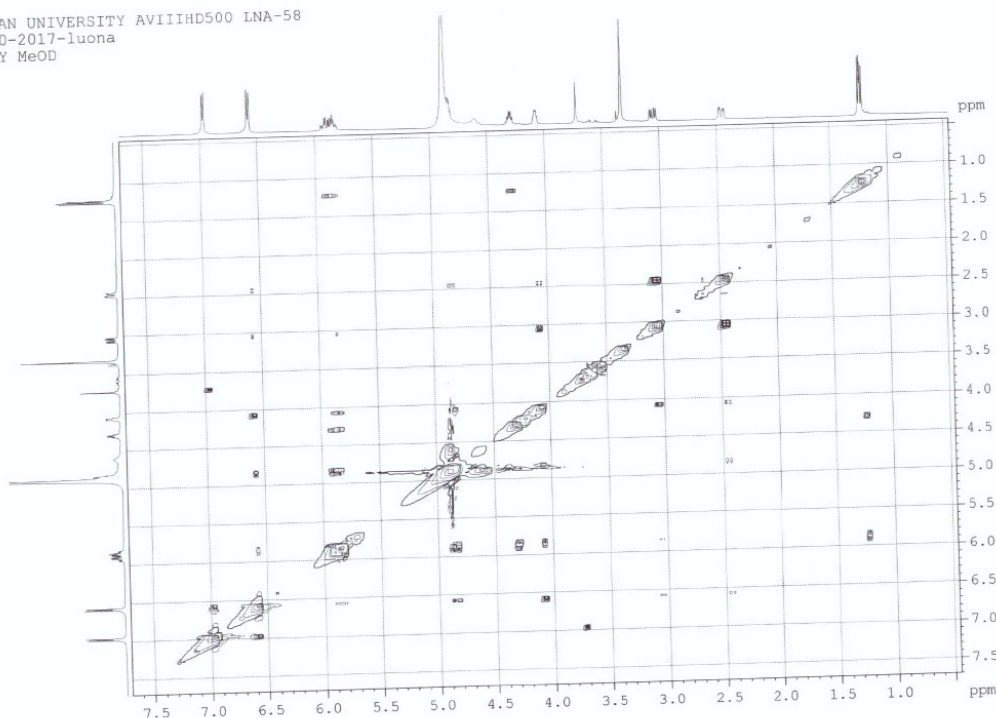


Figure S55. NOESY spectrum of compound (**8**) in MeOD.

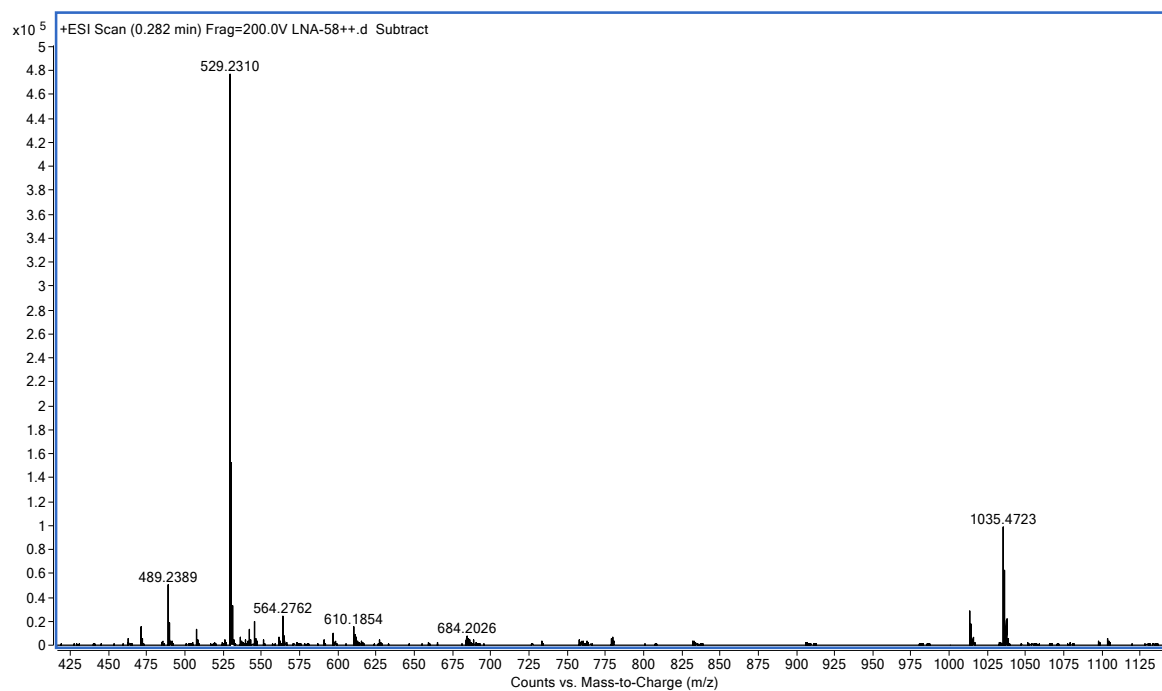


Figure S56. HR ESI-MS spectrum of compound (**8**) (58=69).

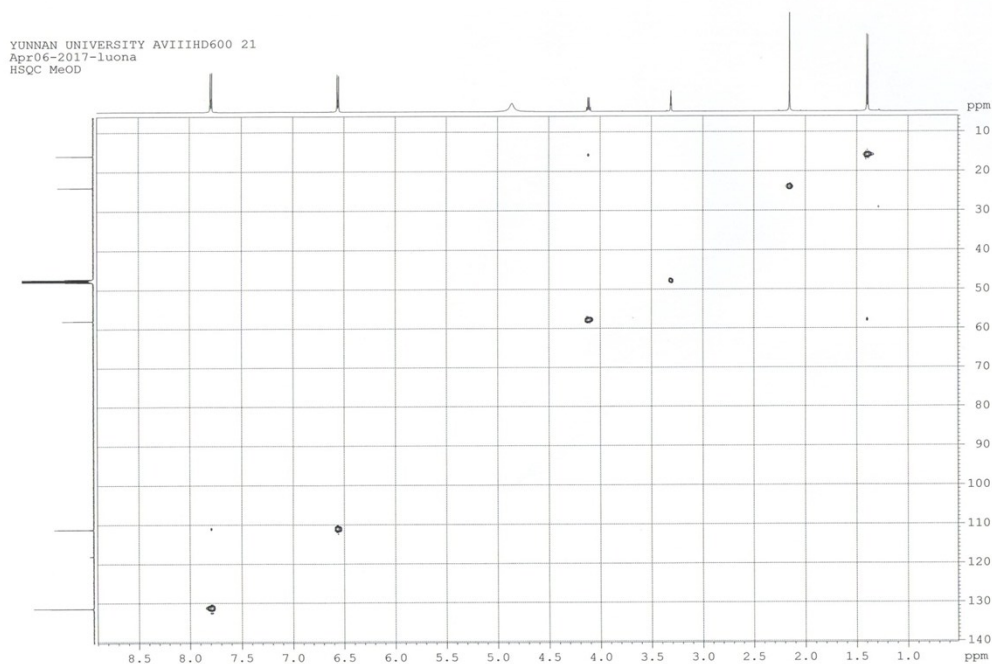


Figure S59. HSQC spectrum of compound (**9**) in MeOD.

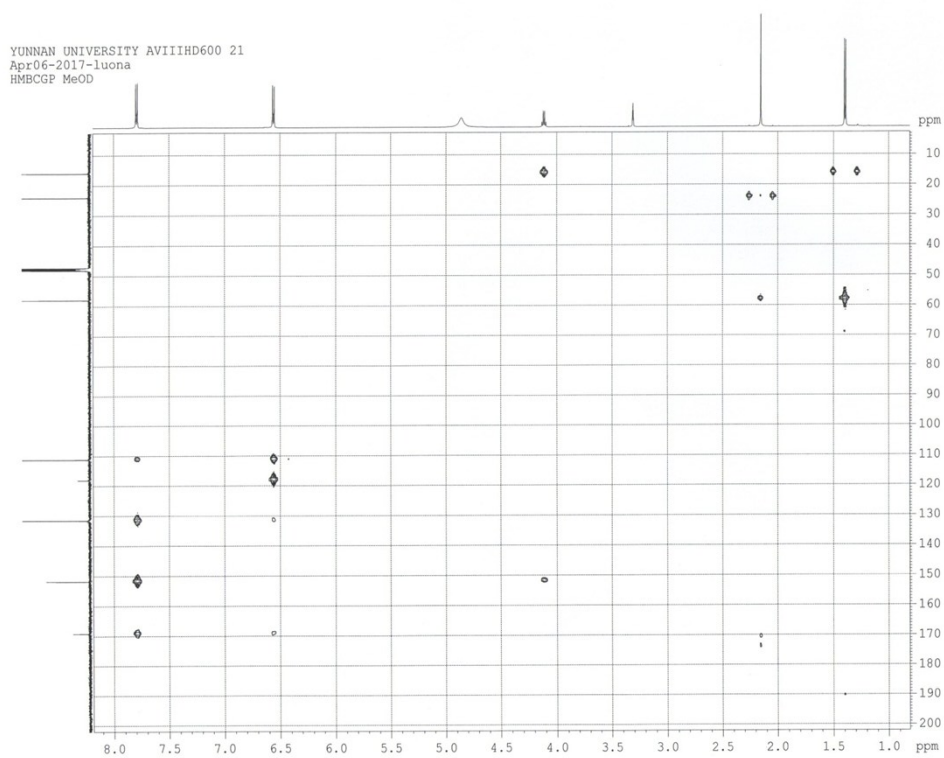


Figure S60. HMBC spectrum of compound (**9**) in MeOD.

YUNNAN UNIVERSITY AVIIHD600 21
Apr06-2017-luona
COSY MeOD

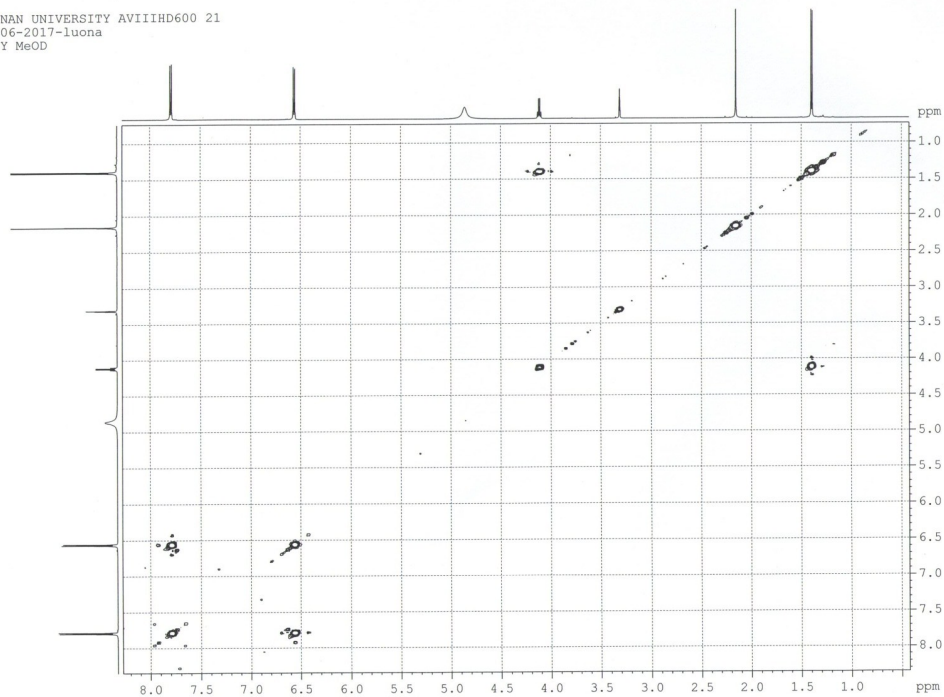


Figure S61. ^1H - ^1H COSY spectrum of compound (**9**) in MeOD.

YUNNAN UNIVERSITY AVIIHD600 21
Apr06-2017-luona
ROESY MeOD

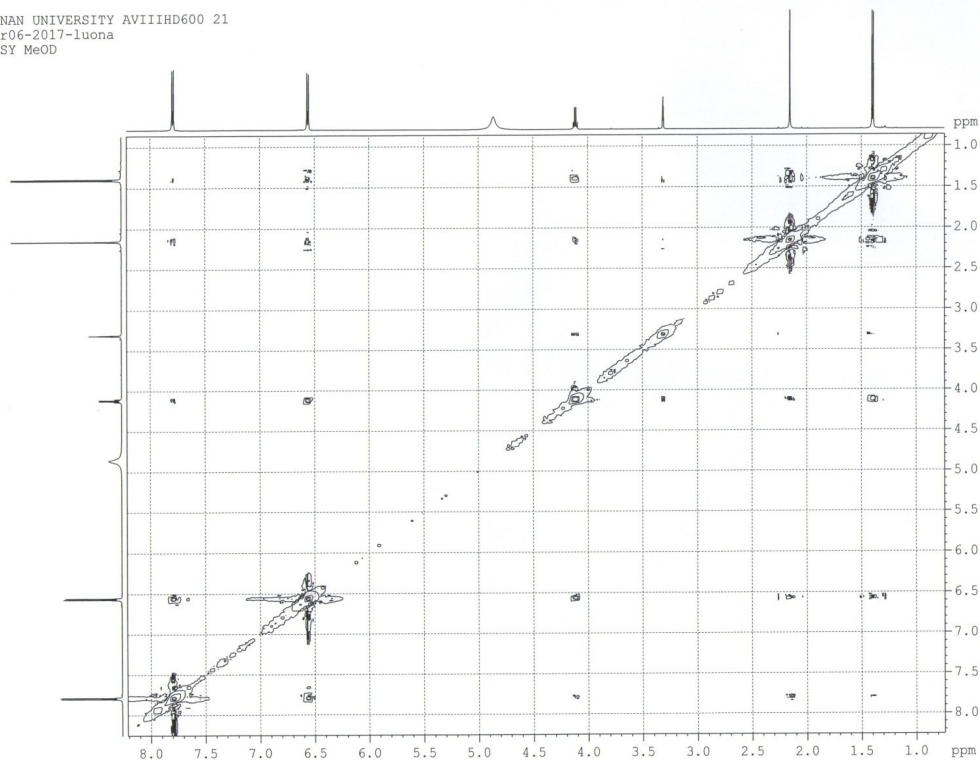


Figure S62. ROESY spectrum of compound (**9**) in MeOD.

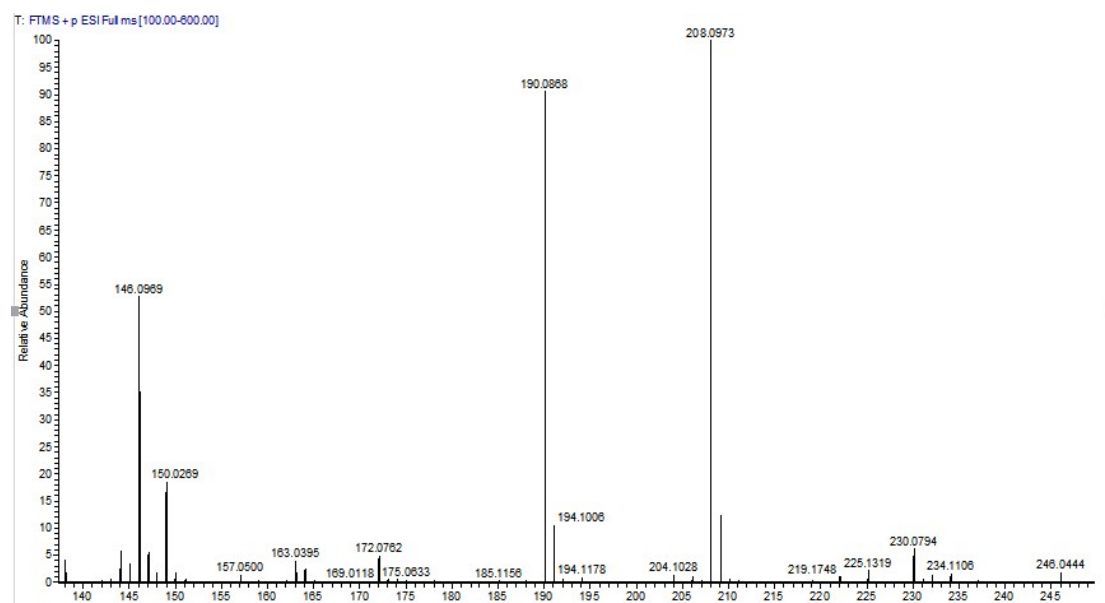


Figure S63. HR ESI-MS spectrum of compound (9) .

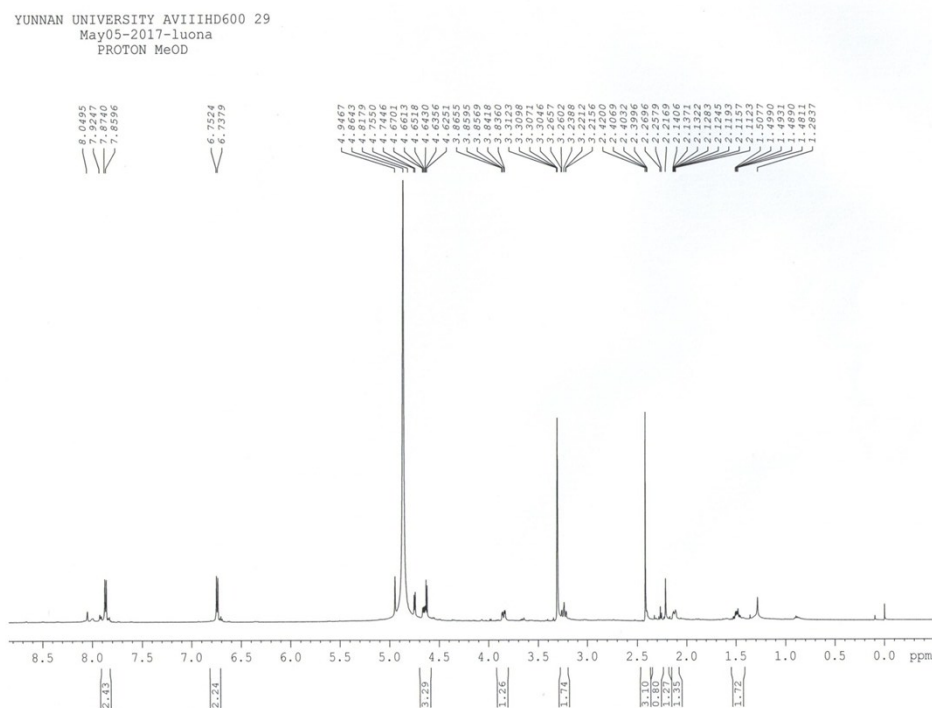


Figure S64. ^1H NMR spectrum of compound (11) in MeOD.

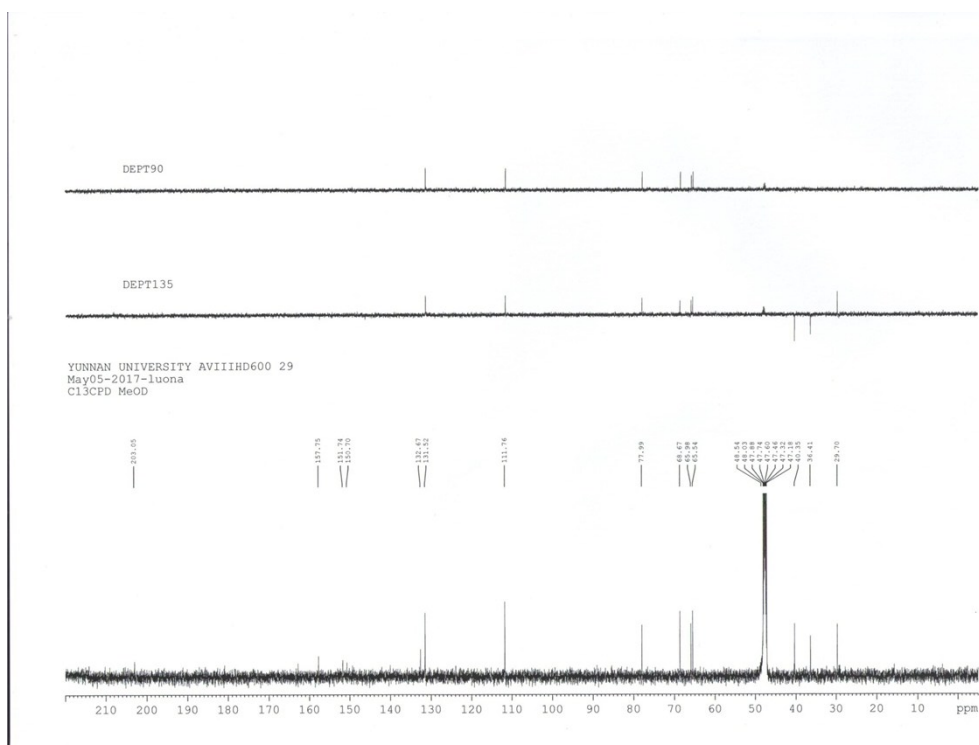


Figure S65. ^{13}C NMR spectrum of compound (11) in MeOD.

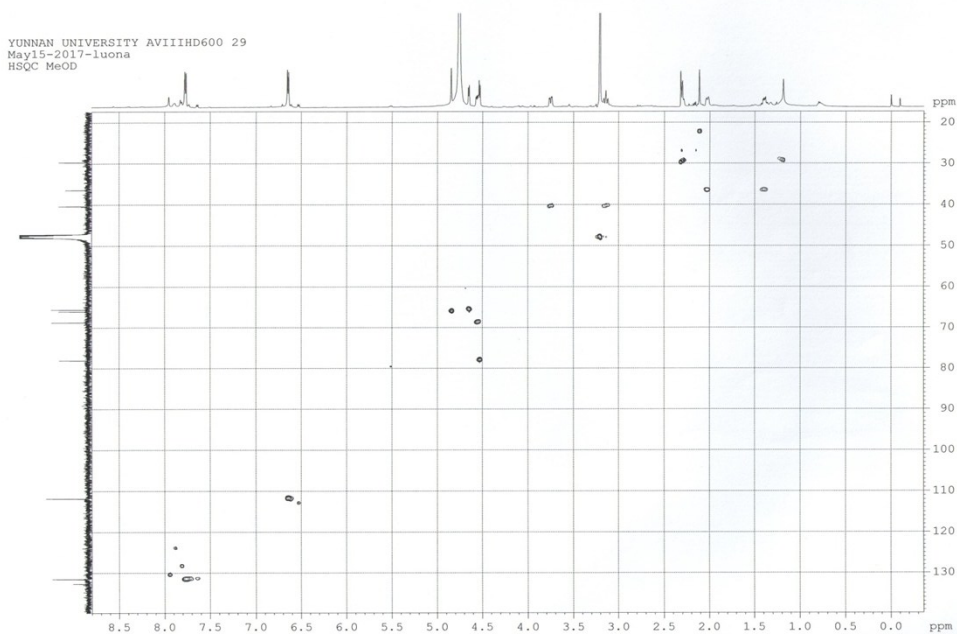


Figure S66. HSQC spectrum of compound (11) in MeOD.

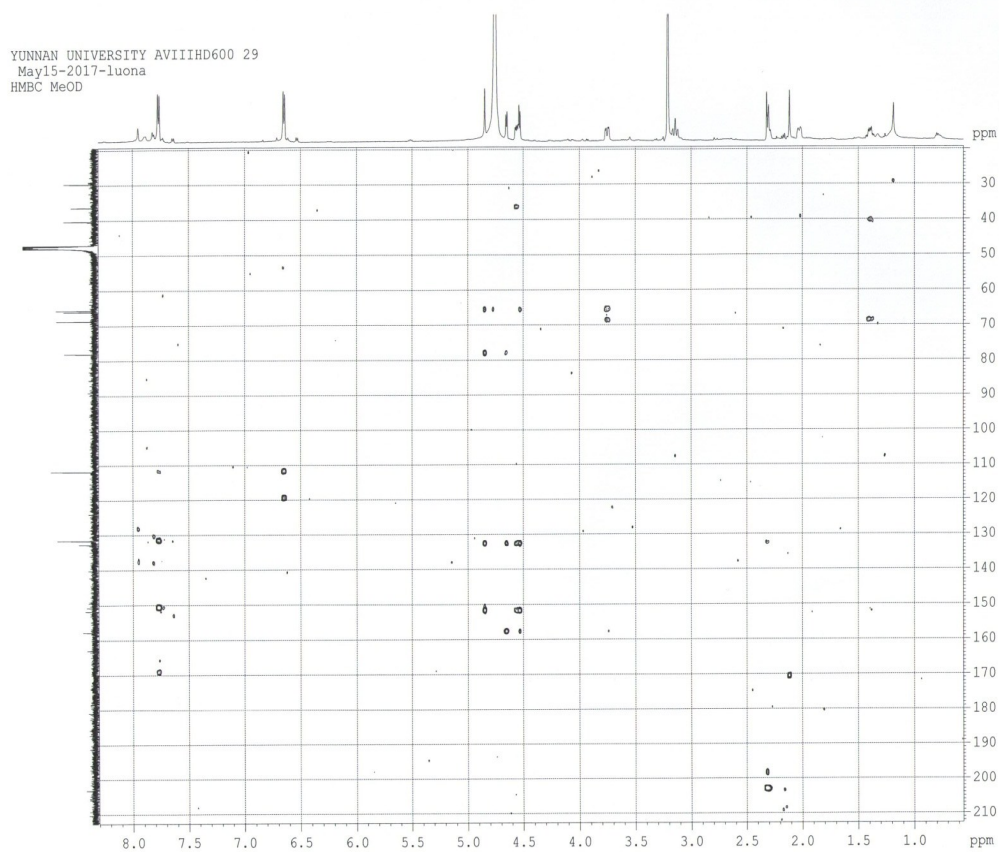


Figure S67. HMBC spectrum of compound (**11**) in MeOD.

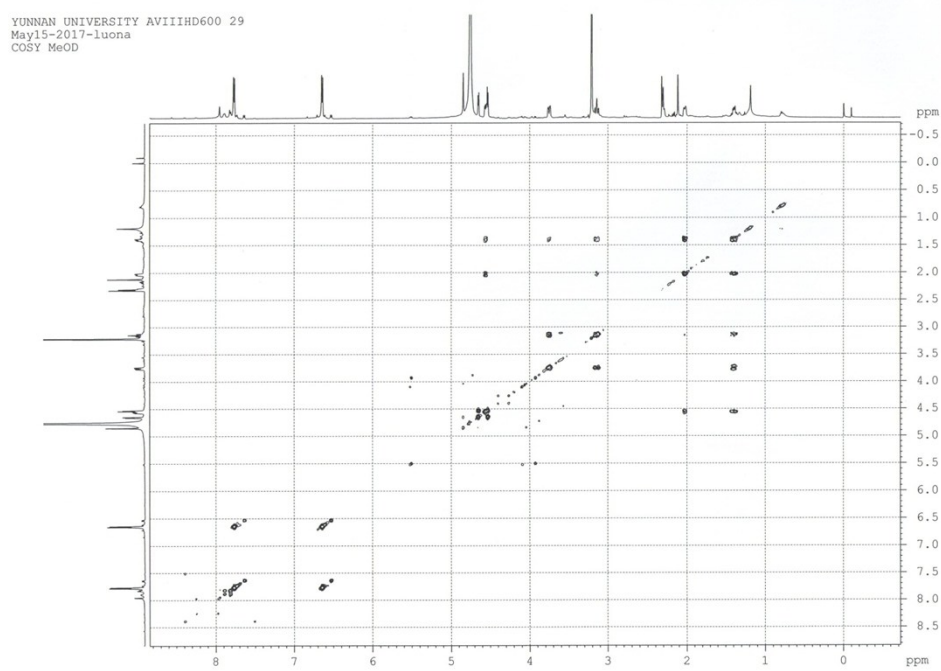


Figure S68. ^1H - ^1H COSY spectrum of compound (**11**) in MeOD.

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NOESY MeOD

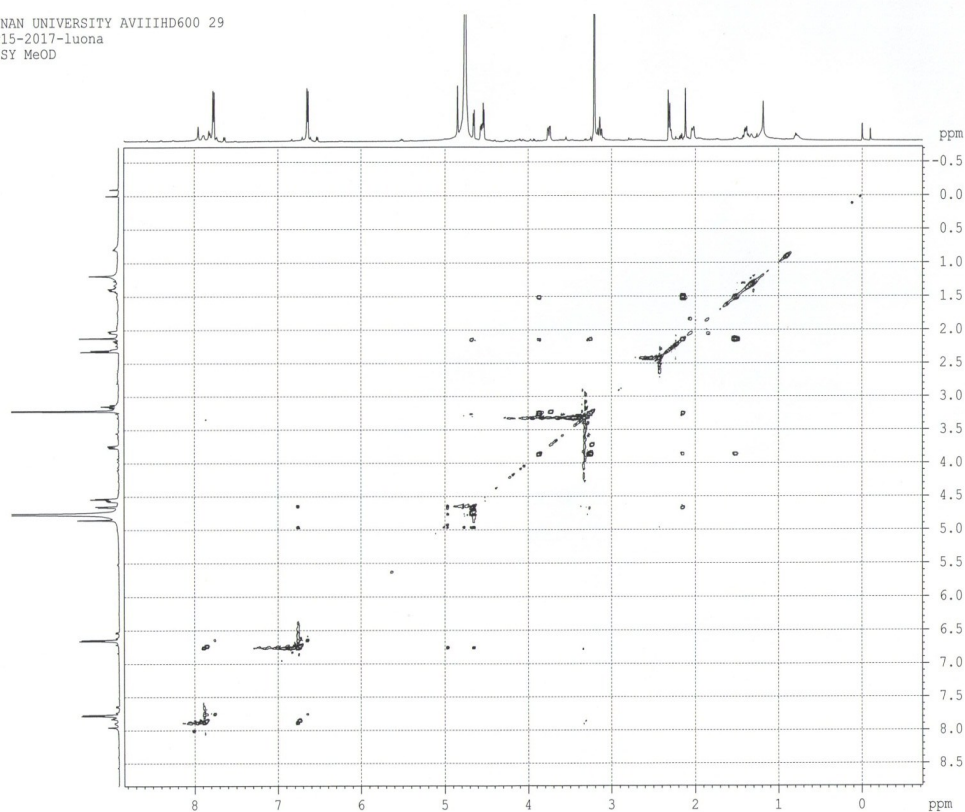


Figure S69. NOESY spectrum of compound (**11**) in MeOD.

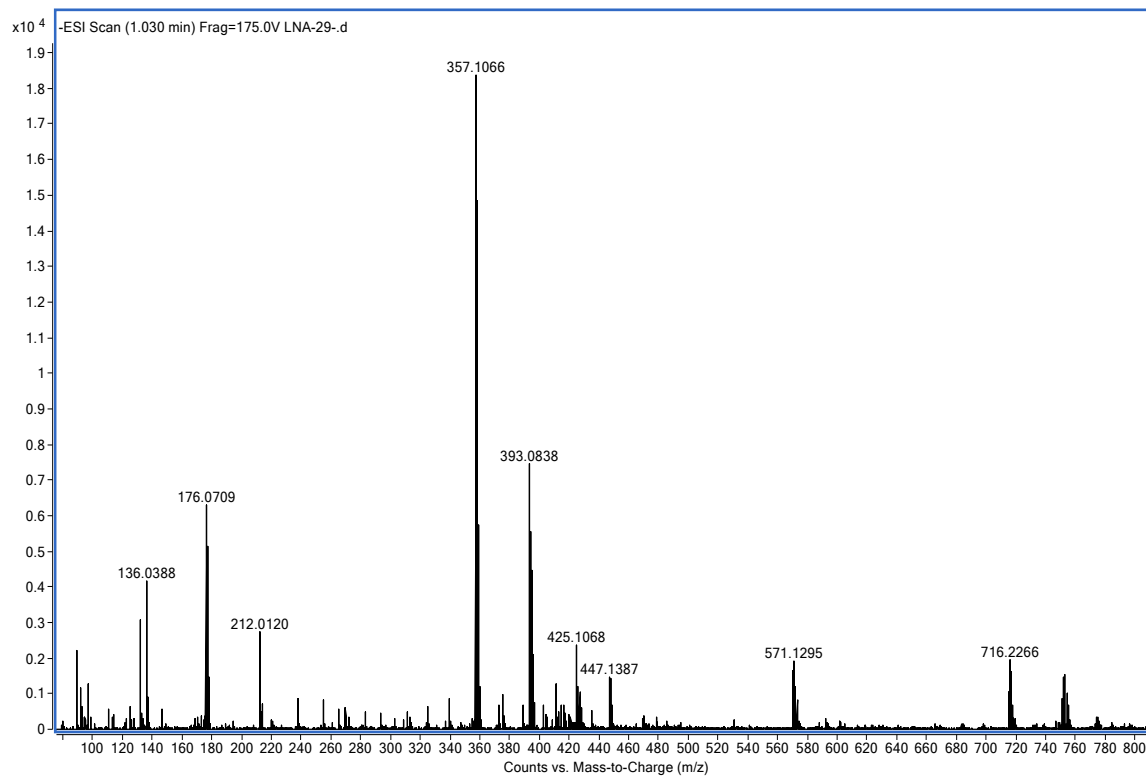


Figure S70. HR ESI-MS spectrum of compound (**11**) .

YUNNAN UNIVERSITY ASCEND AVIIHD600 51
Jun01-2017-luona
HSQC MeOD

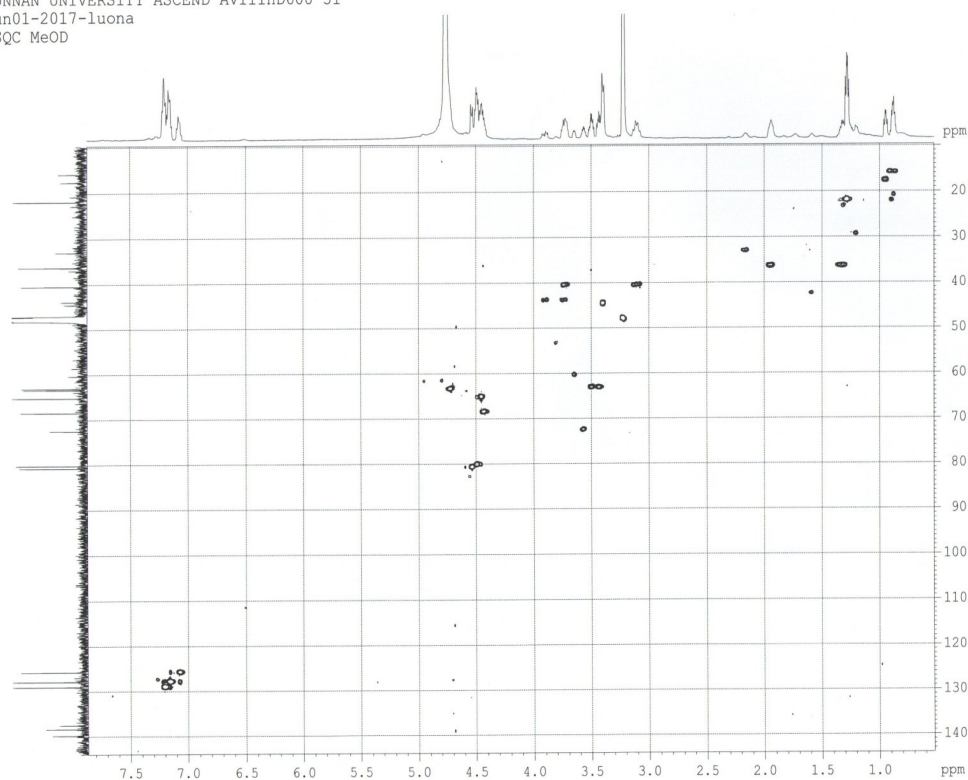


Figure S73. HSQC spectrum of compound (**13**) in MeOD.

YUNNAN UNIVERSITY ASCEND AVIIHD600 51
Jun01-2017-luona
HMBC MeOD

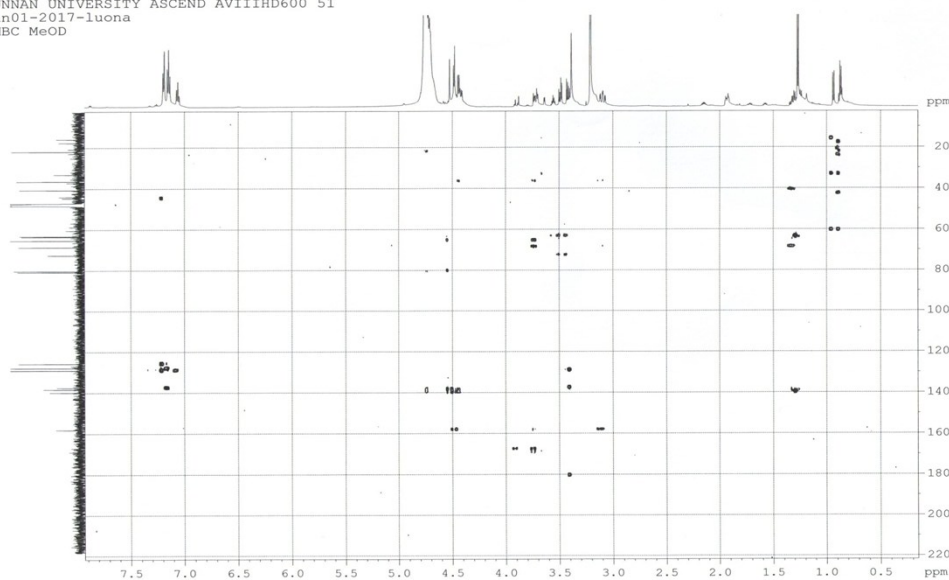


Figure S74. HMBC spectrum of compound (**13**) in MeOD.

YUNNAN UNIVERSITY ASCEND AVIIHD600 51
Jun01-2017-luona
COSY MeOD

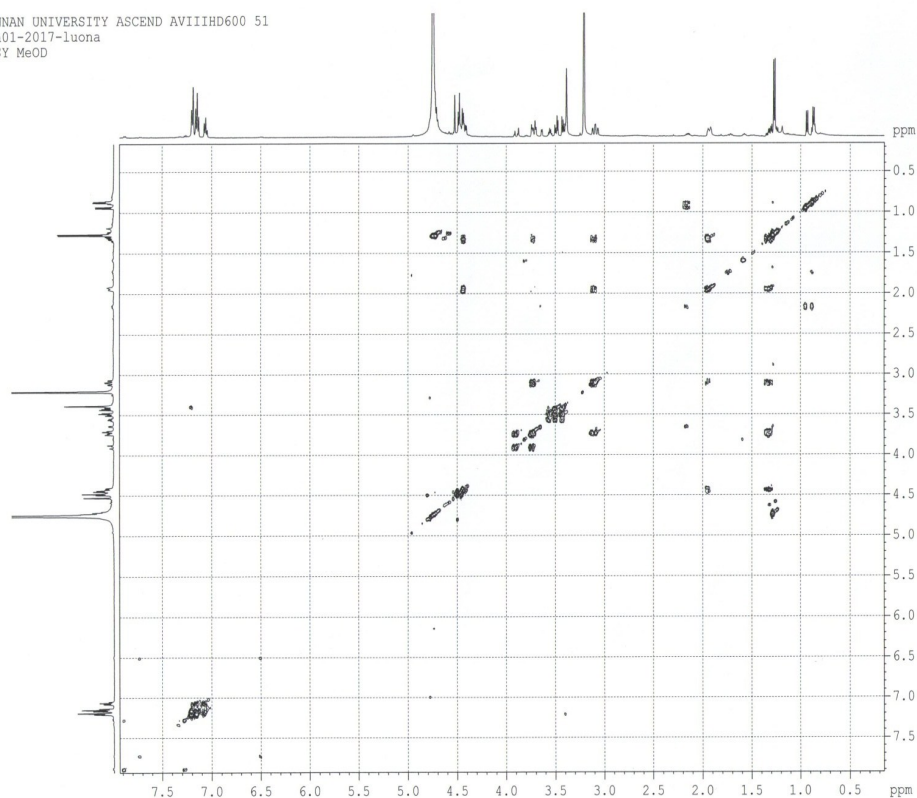


Figure S75. ¹H-¹H COSY spectrum of compound (13) in MeOD.

YUNNAN UNIVERSITY ASCEND AVIIHD600 51
Jun01-2017-luona
NOESY MeOD

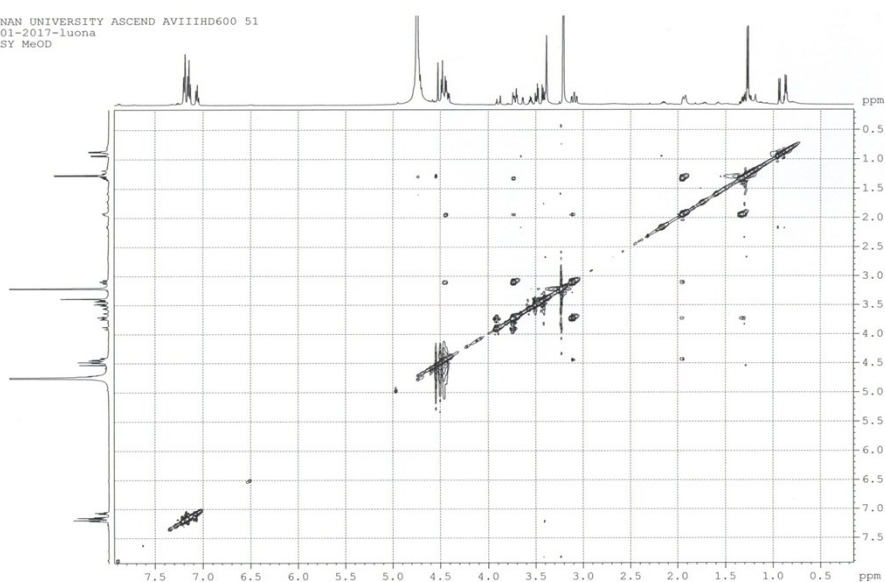


Figure S76. NOESY spectrum of compound (13) in MeOD.

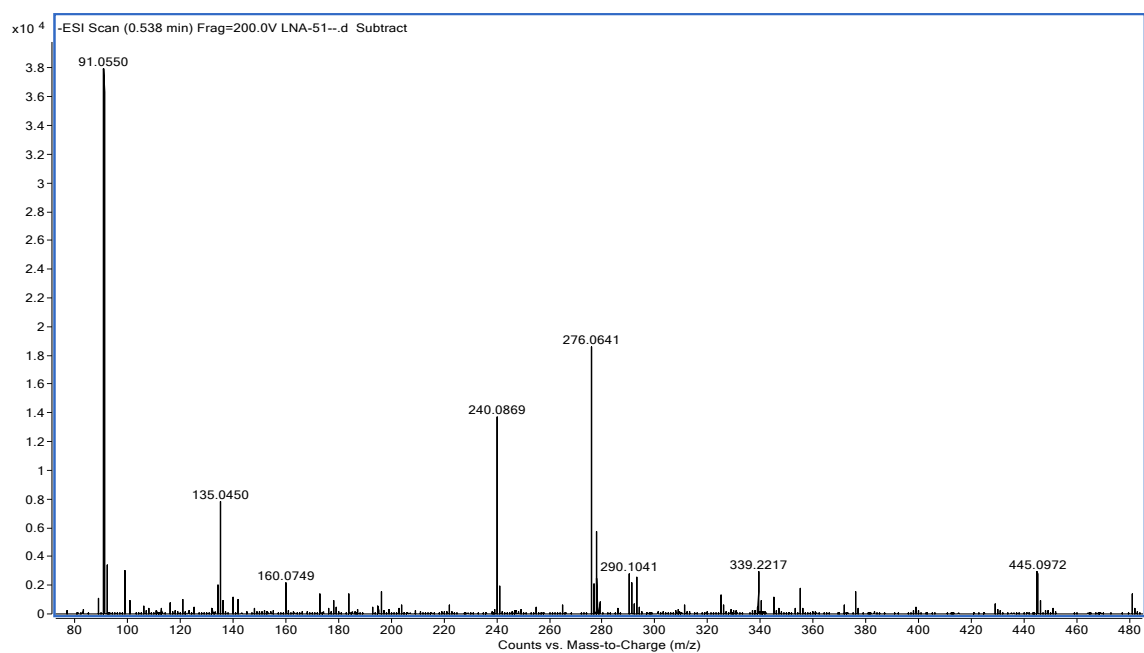


Figure S77. HR ESI-MS spectrum of compound (13)

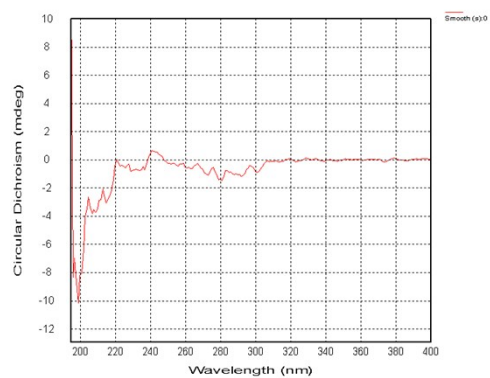


Figure S78 CD spectrum compound 6

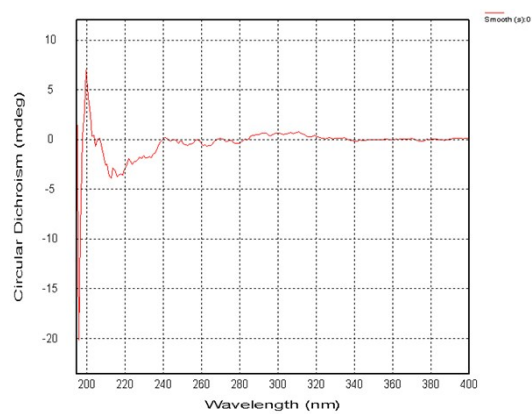


Figure S79 CD spectrum V of compound **7**