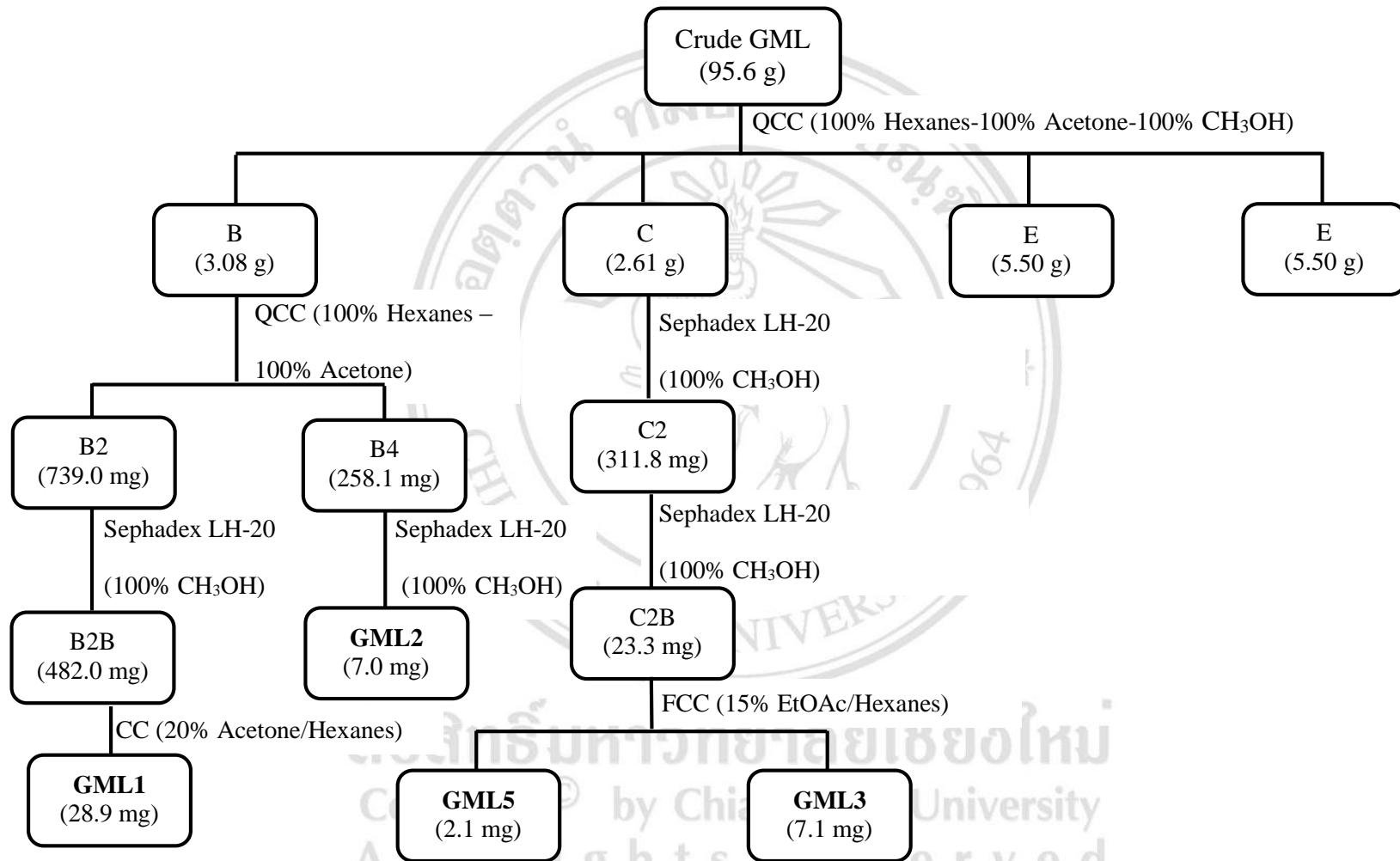
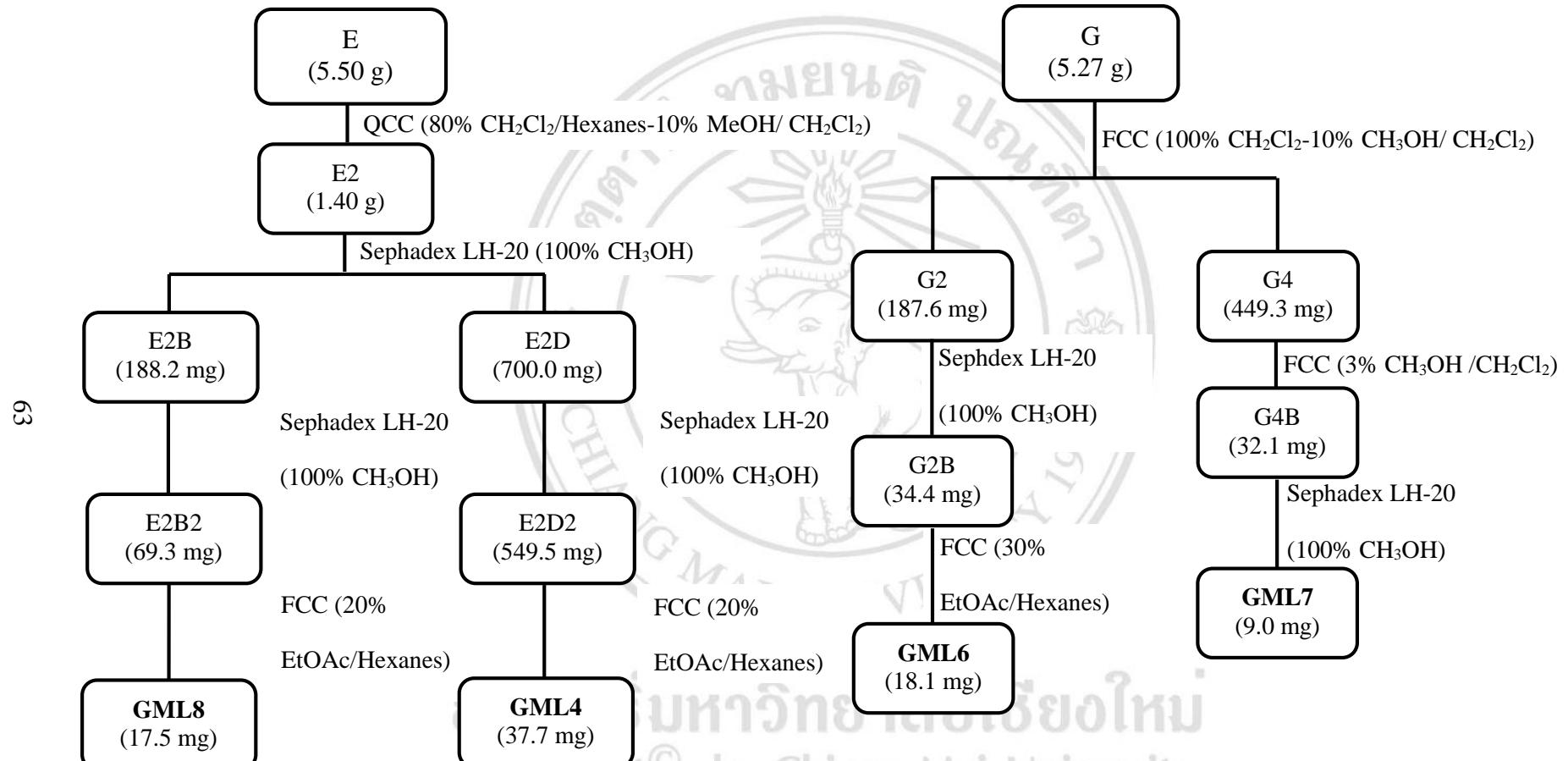


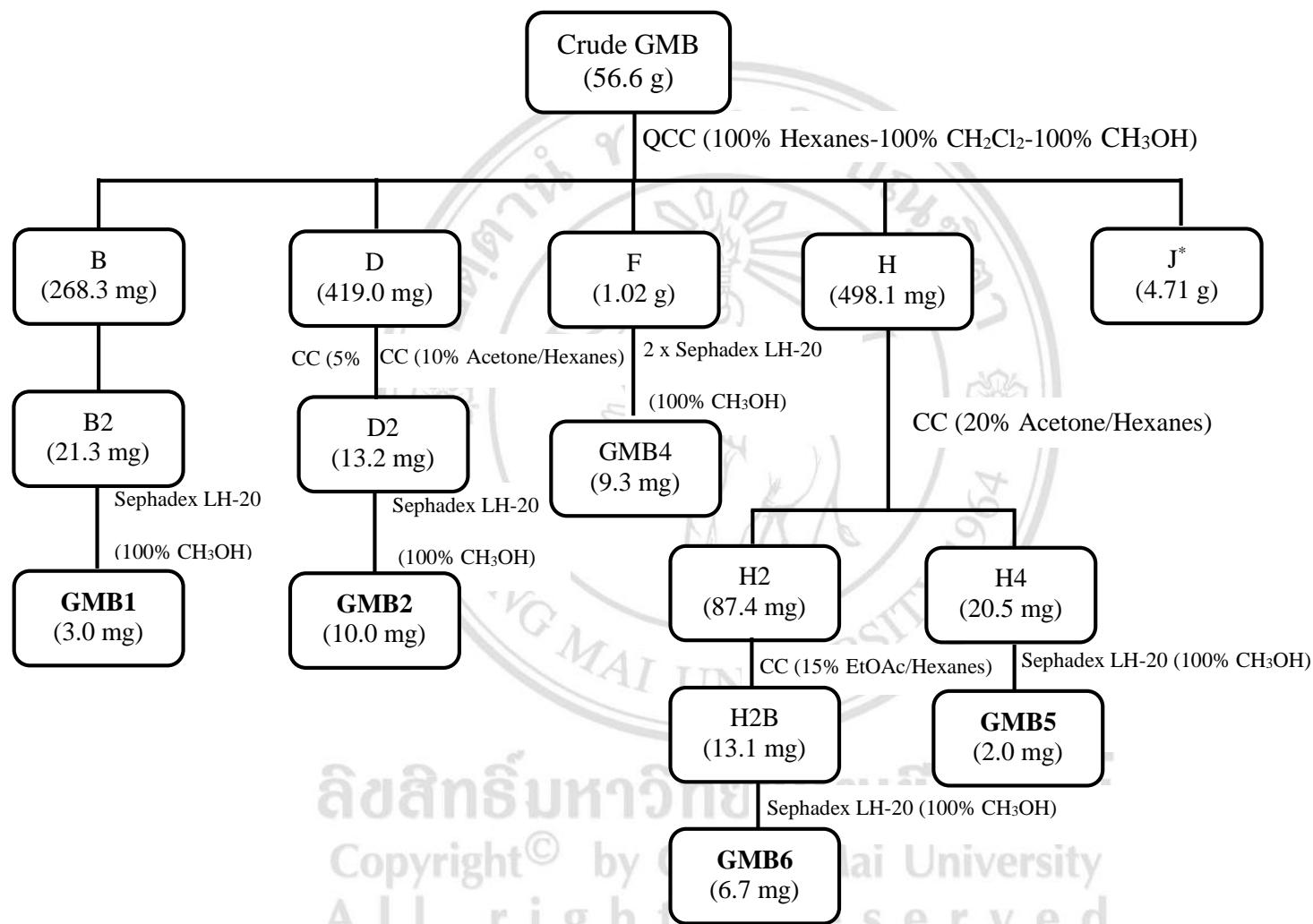
## APPENDIX

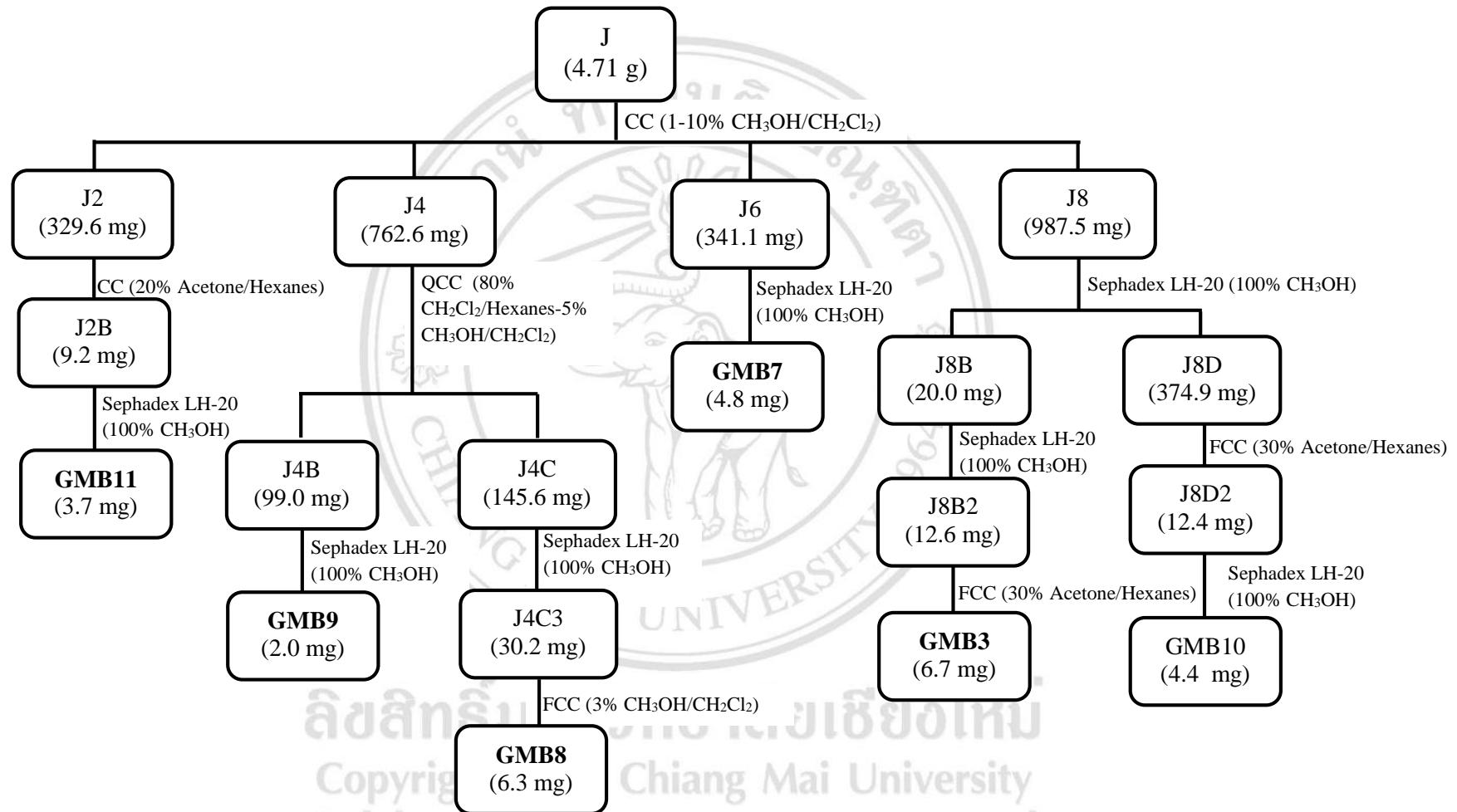
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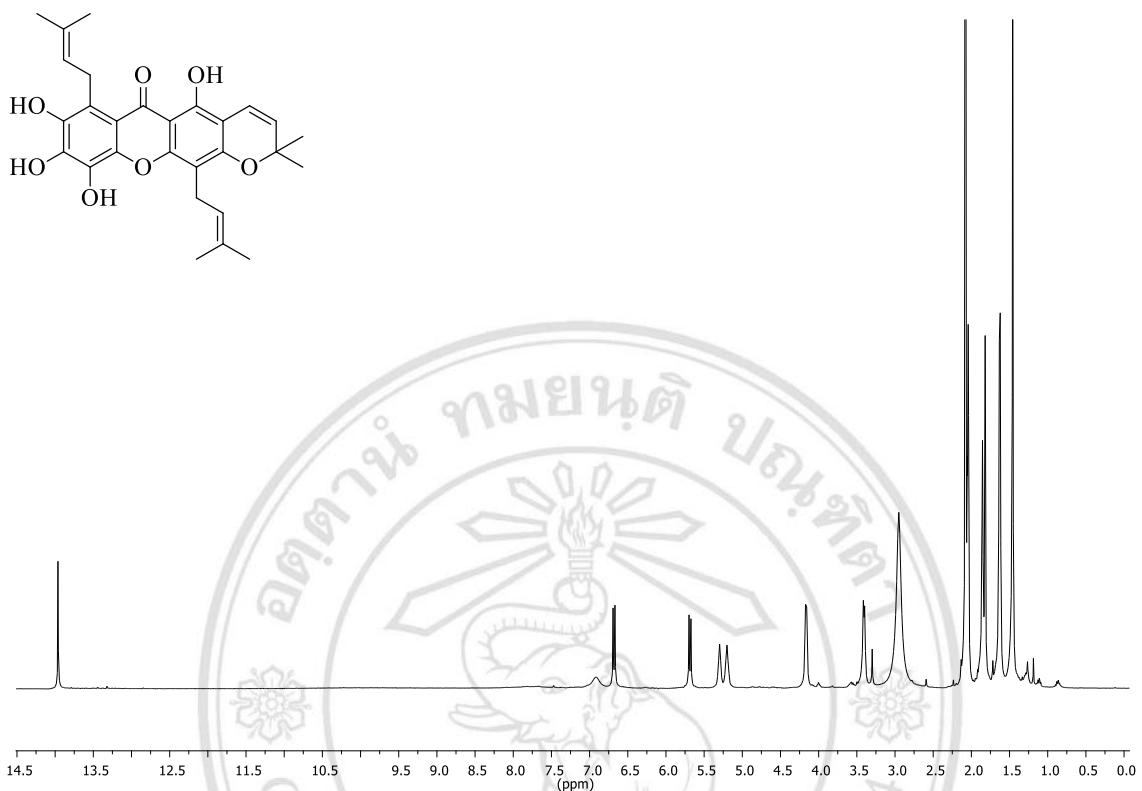


**Figure 2** Isolated Compounds from Leaves of *G. mckeaniana*



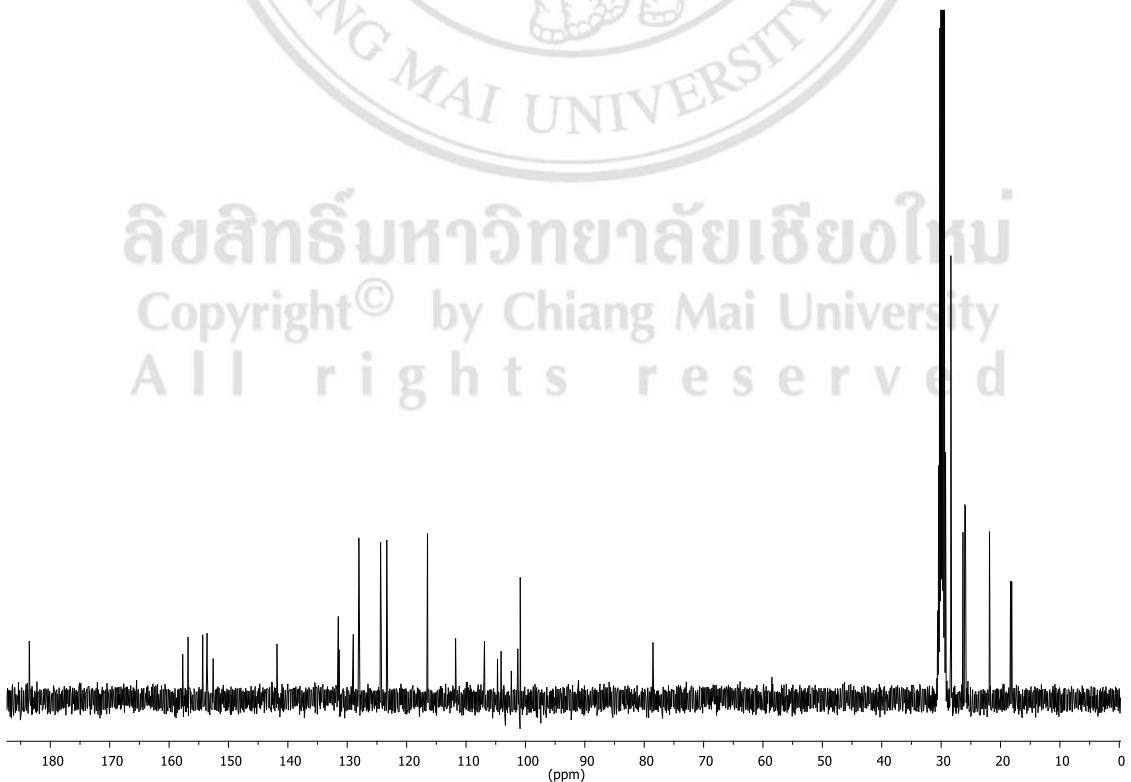


**Figure 3** Isolated Compounds from Stem Bark of *G. mckeaniana*

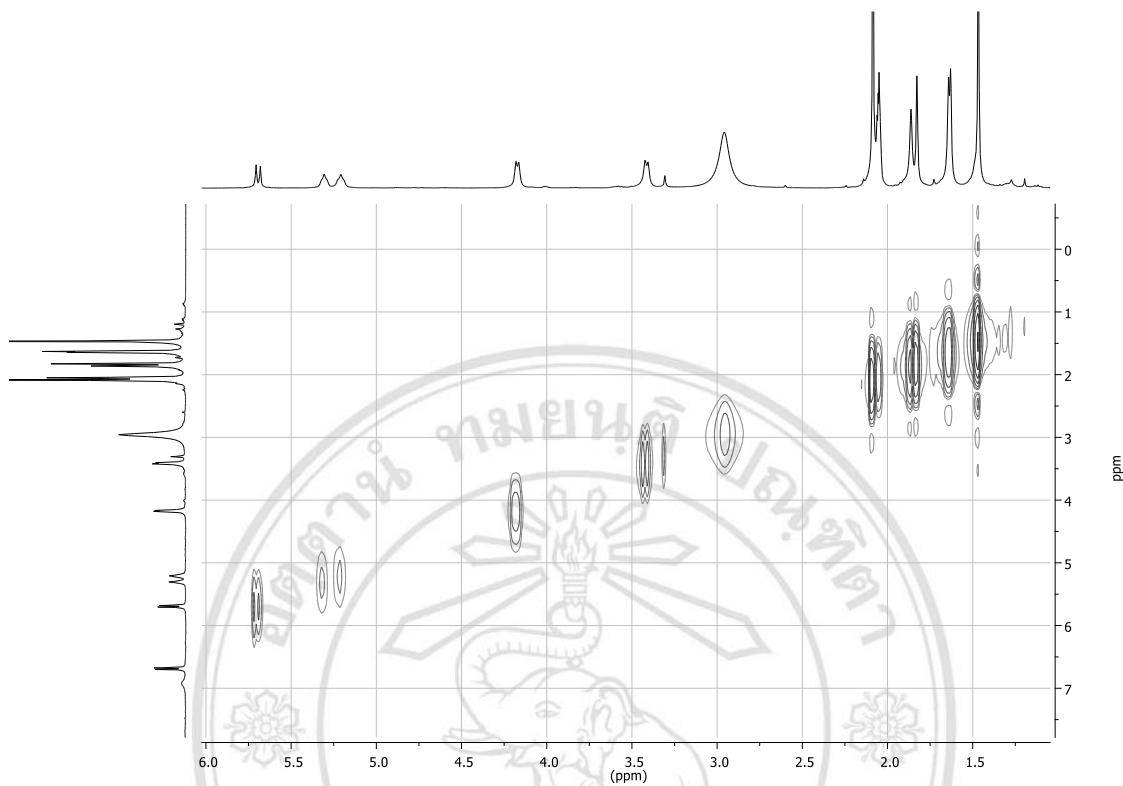


**Figure 4**  $^1\text{H}$  NMR (400 MHz, Acetone- $d_6$ ) Spectrum of **GML1**

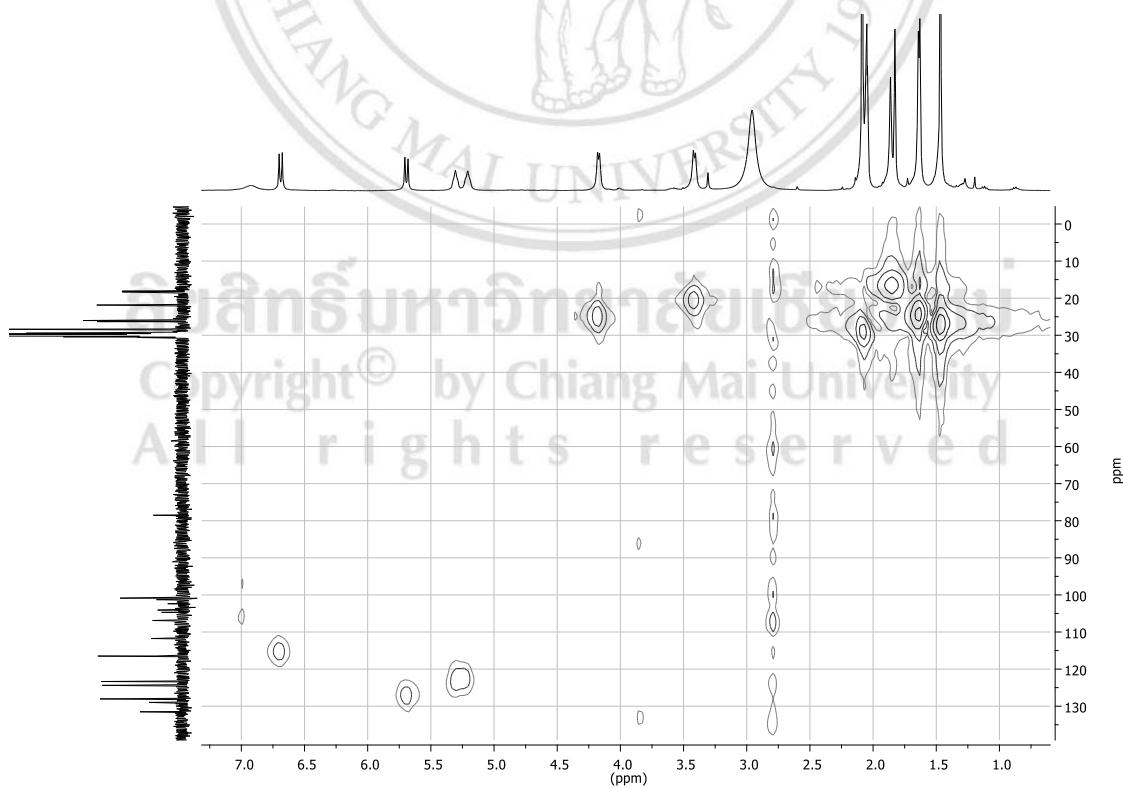
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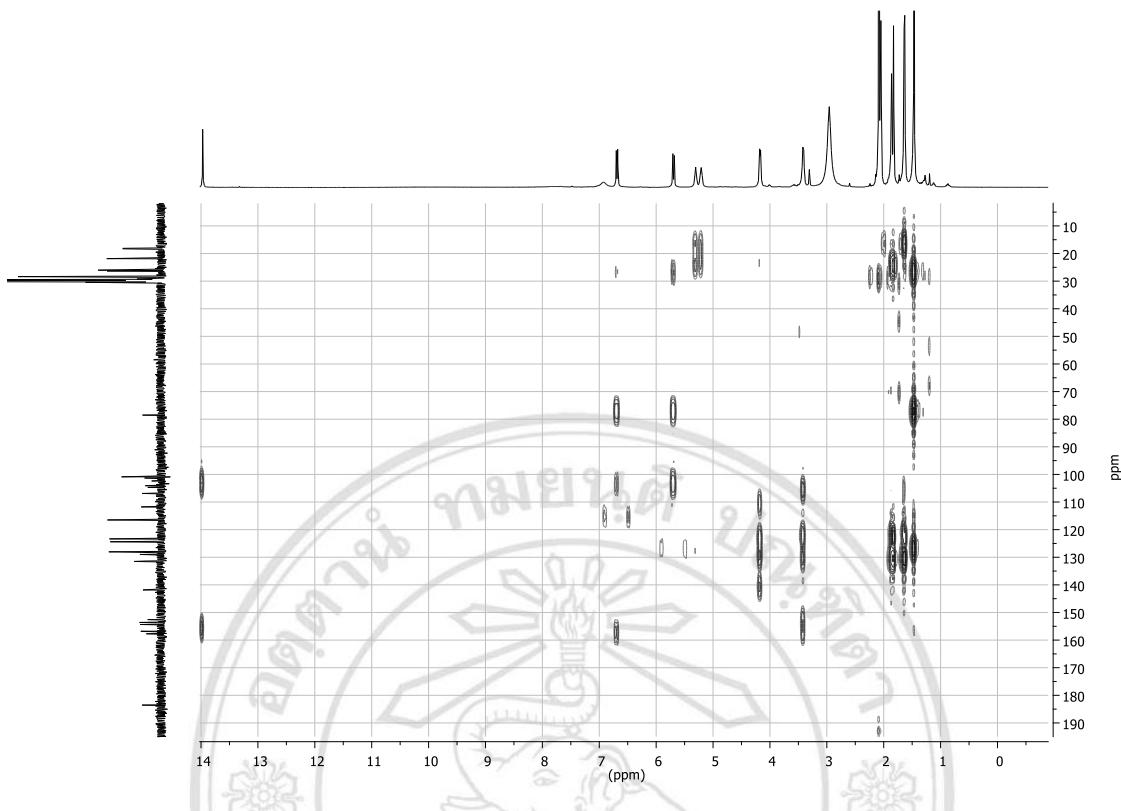
**Figure 5**  $^{13}\text{C}$  NMR (100 MHz, Acetone- $d_6$ ) Spectrum of **GML1**



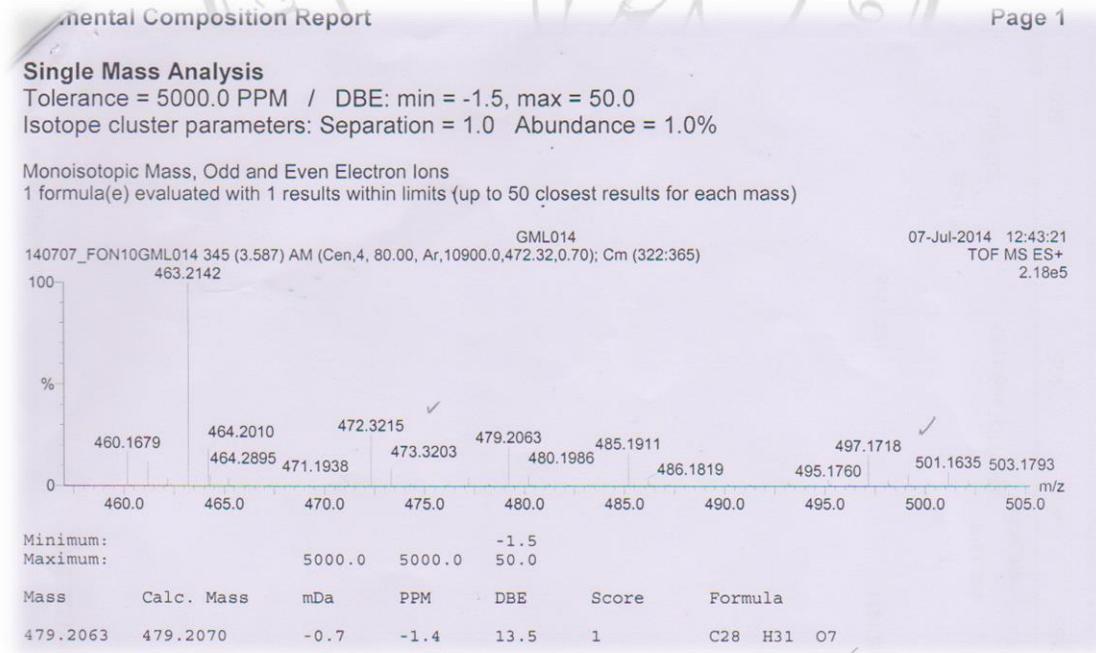
**Figure 6** COSY Spectrum of **GML1** in Acetone- $d_6$



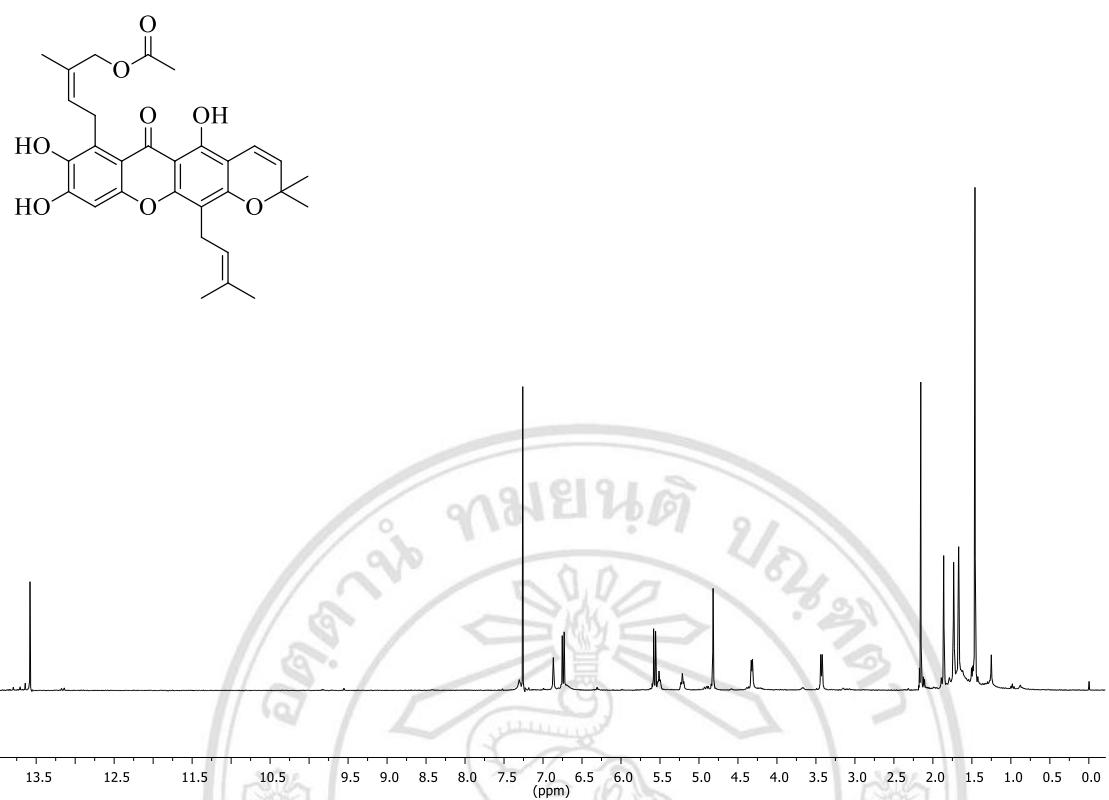
**Figure 7** HMQC Spectrum of **GML1** in Acetone- $d_6$



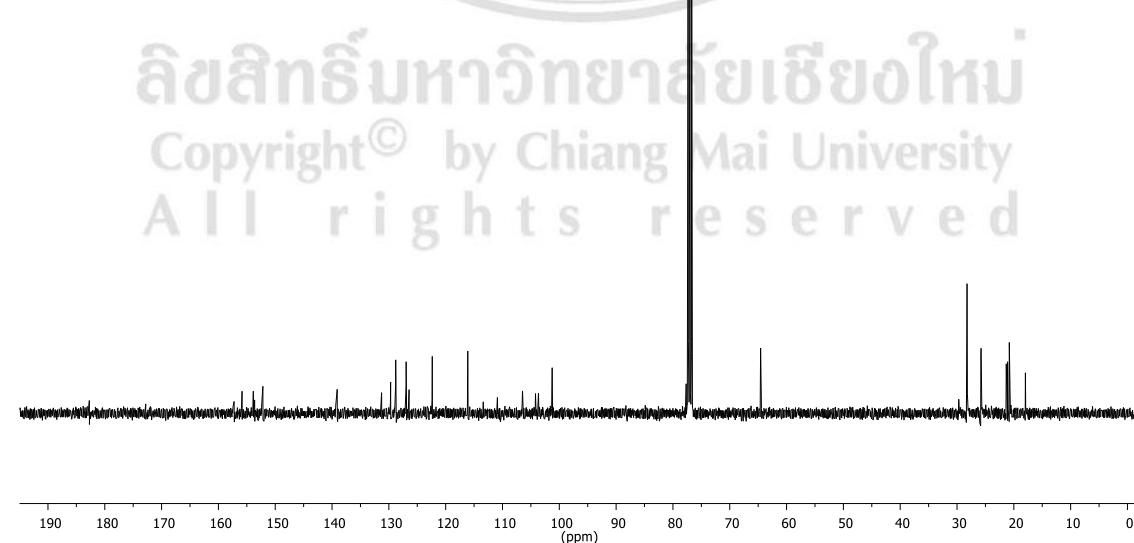
**Figure 8 HMBC Spectrum of GML1 in Acetone-*d*<sub>6</sub>**



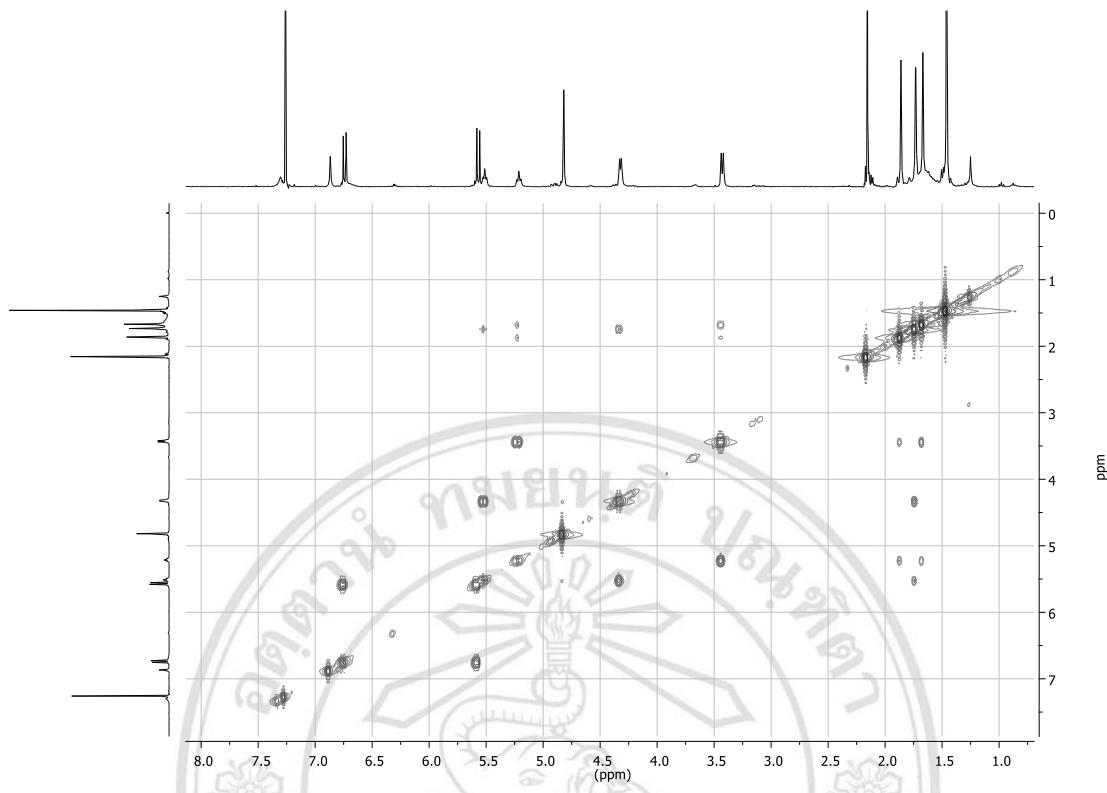
**Figure 9 HRESI-MS Spectrum of GML1**



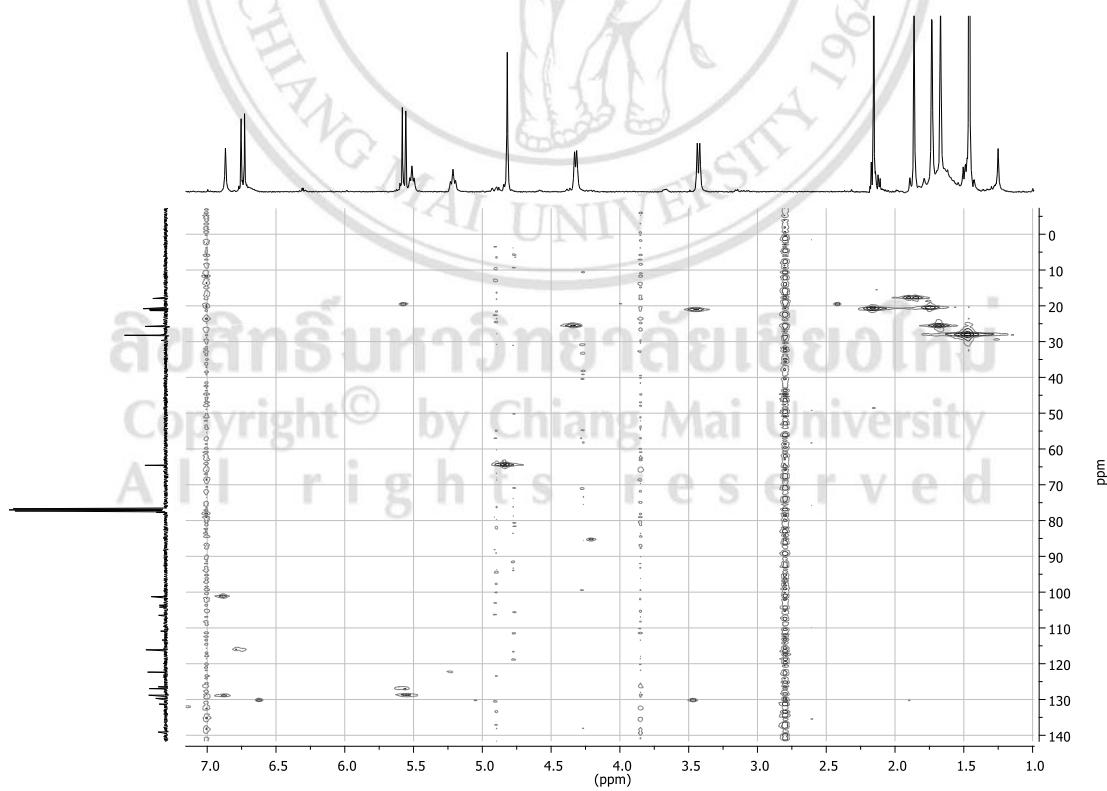
**Figure 10**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) Spectrum of **GML2**



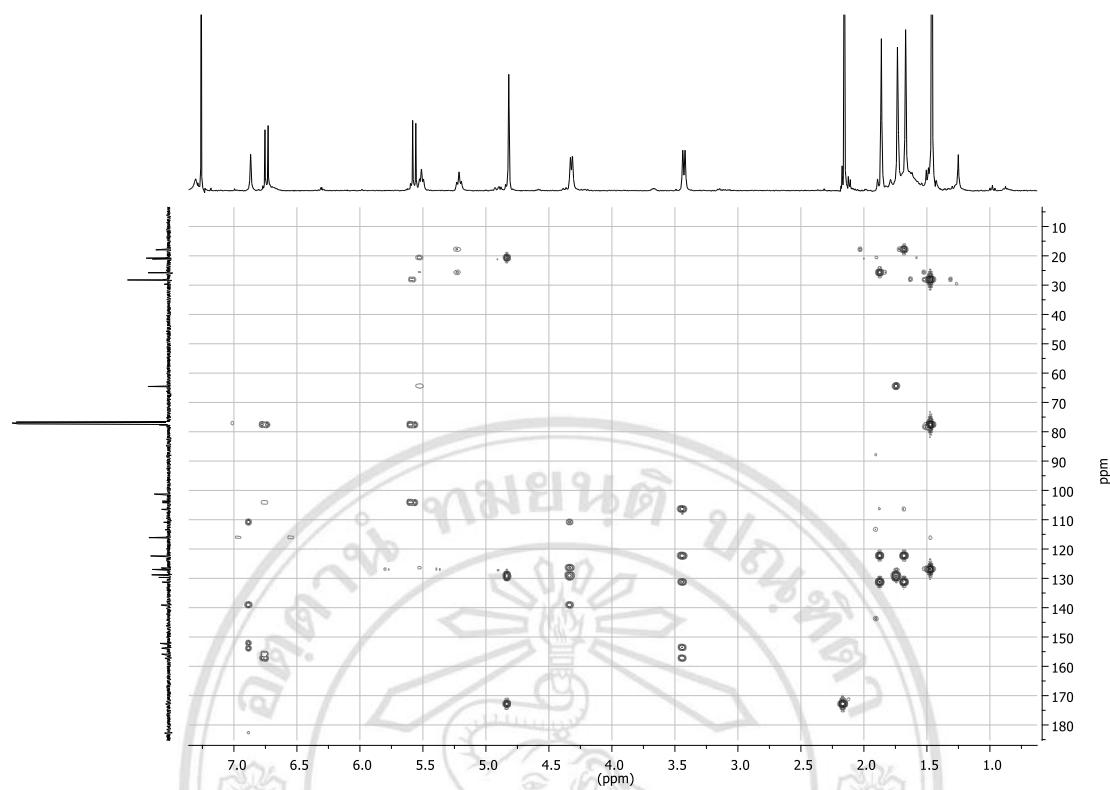
**Figure 11**  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) Spectrum of **GML2**



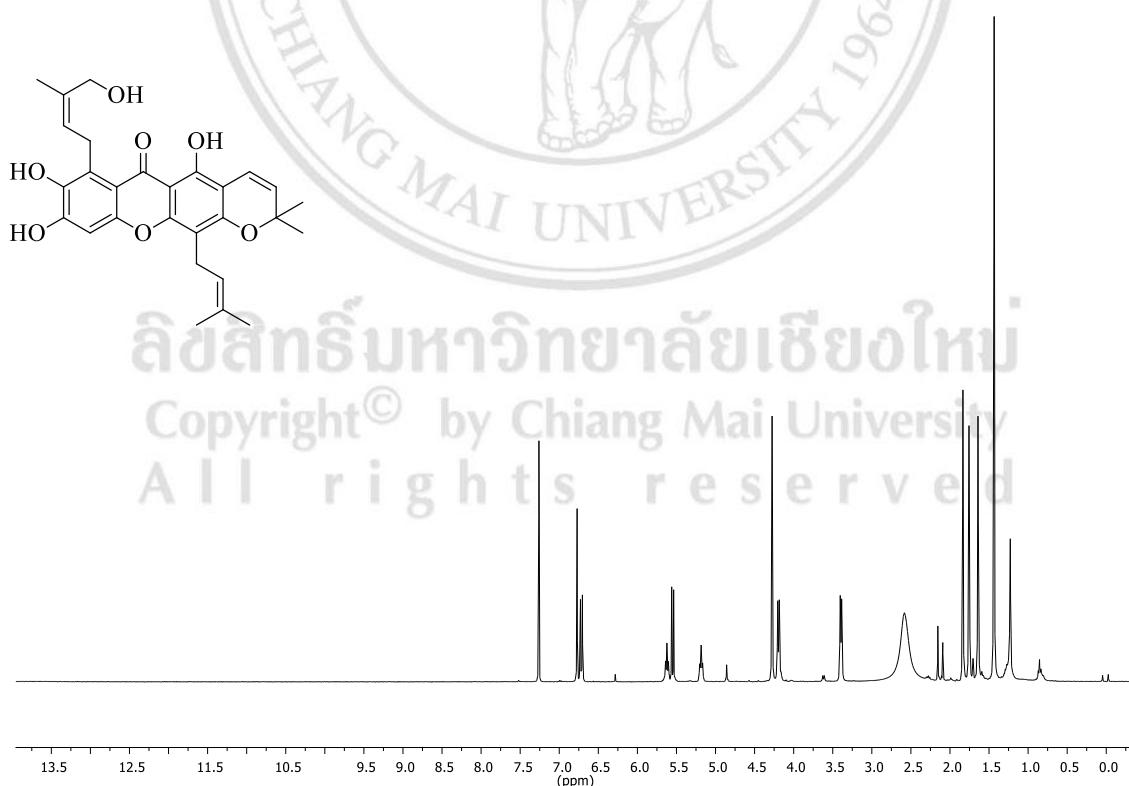
**Figure 12** COSY Spectrum of **GML2** in  $\text{CDCl}_3$



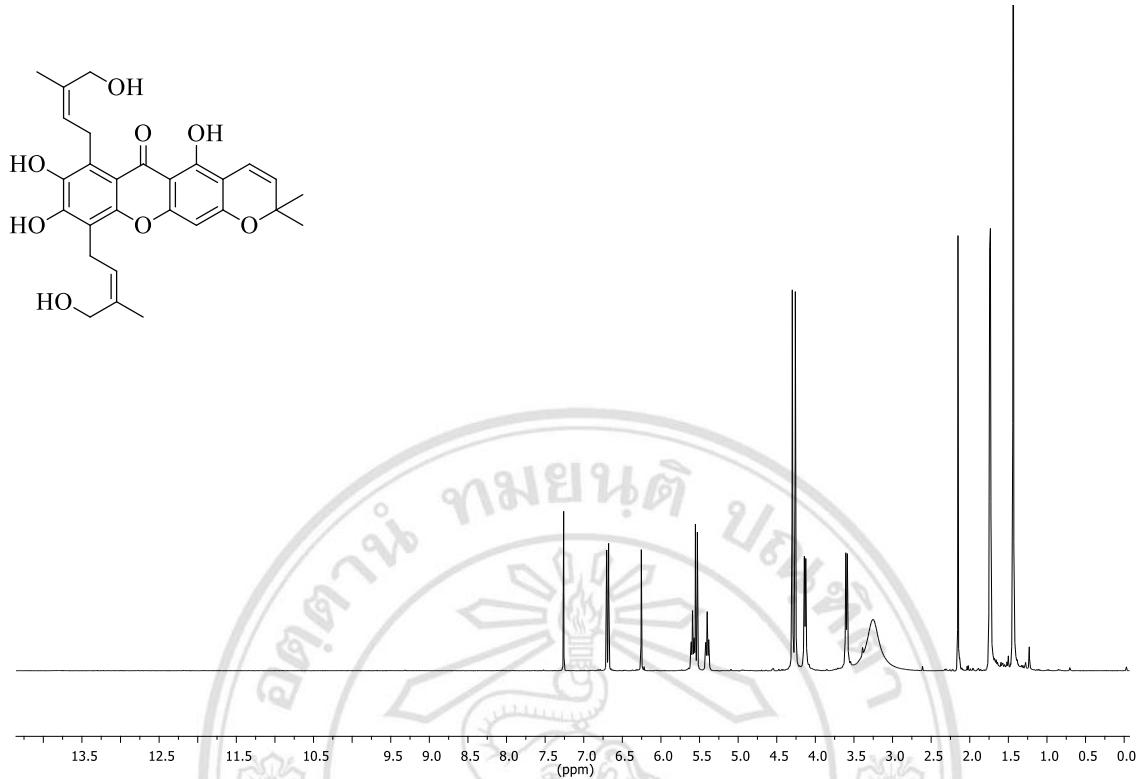
**Figure 13** HMQC Spectrum of **GML2** in  $\text{CDCl}_3$



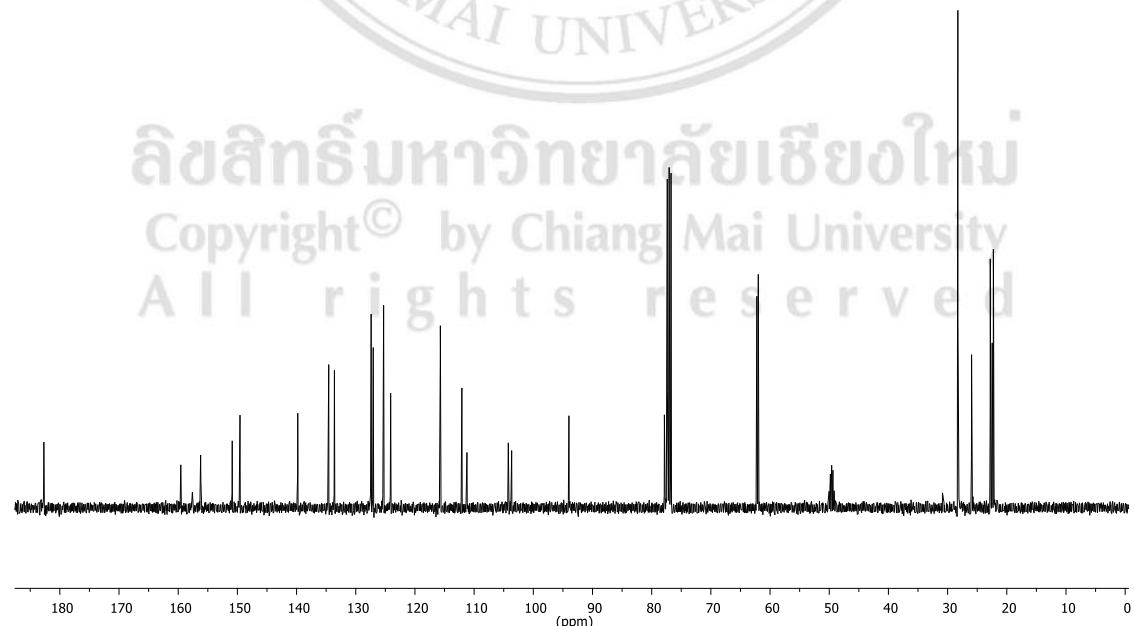
**Figure 14** HMBC Spectrum of **GML2** in  $\text{CDCl}_3$



**Figure 15**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) Spectrum of **GML3**



**Figure 16**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) Spectrum of **GML4**



**Figure 17**  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) Spectrum of **GMB4**

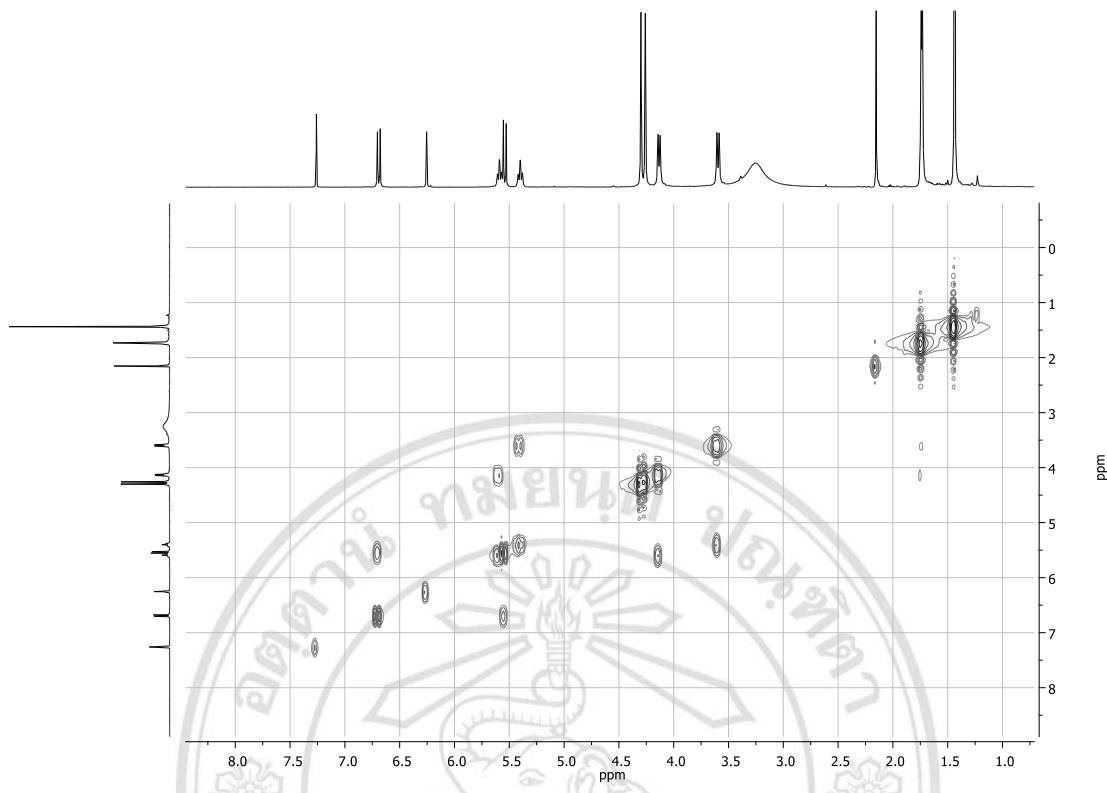


Figure 18 COSY Spectrum of GML4 in  $\text{CDCl}_3$

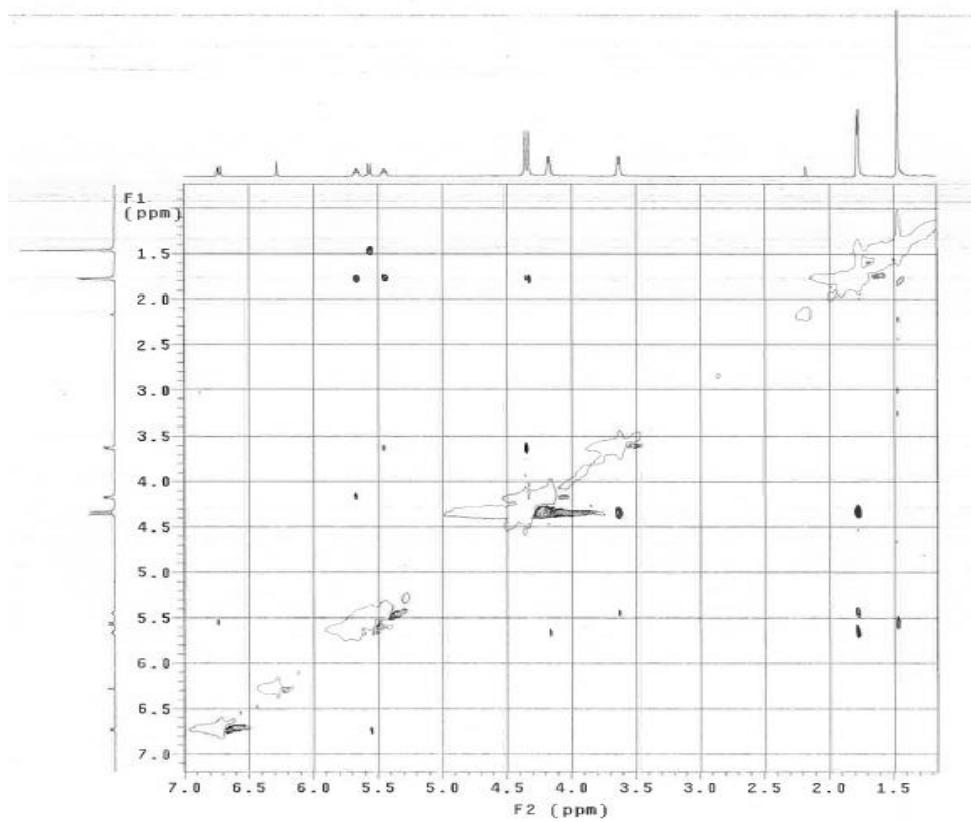
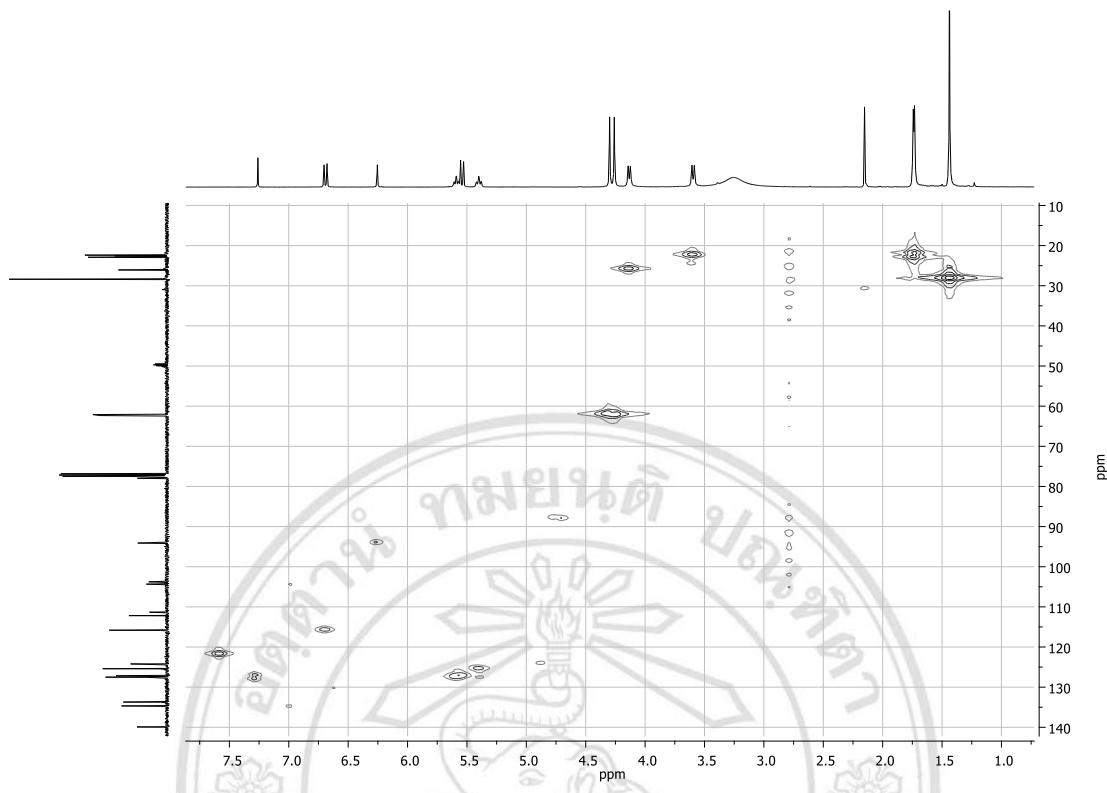
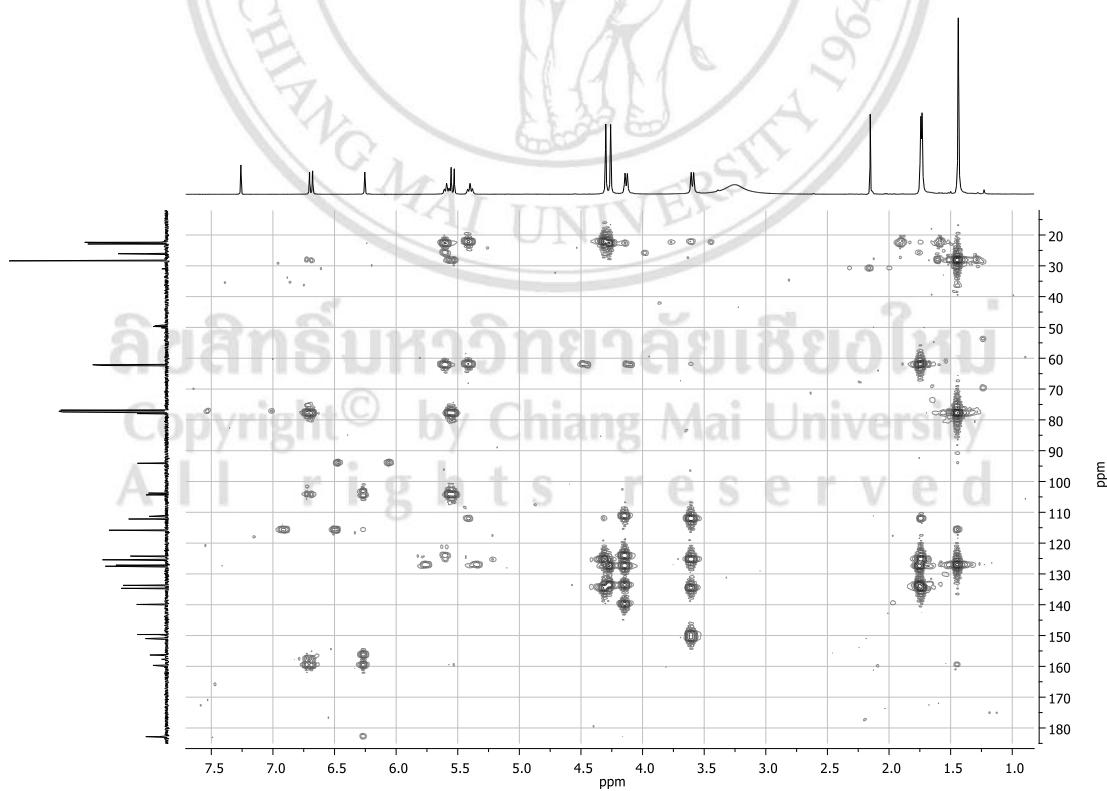


Figure 19 NOESY Spectrum of GML4 in  $\text{CDCl}_3$



**Figure 20** HMQC Spectrum of **GML4** in  $\text{CDCl}_3$



**Figure 21** HMBC Spectrum of **GML4** in  $\text{CDCl}_3$

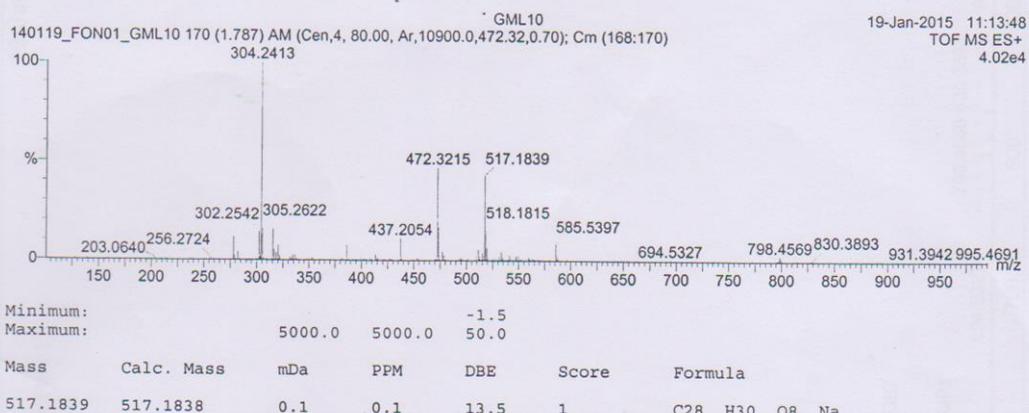
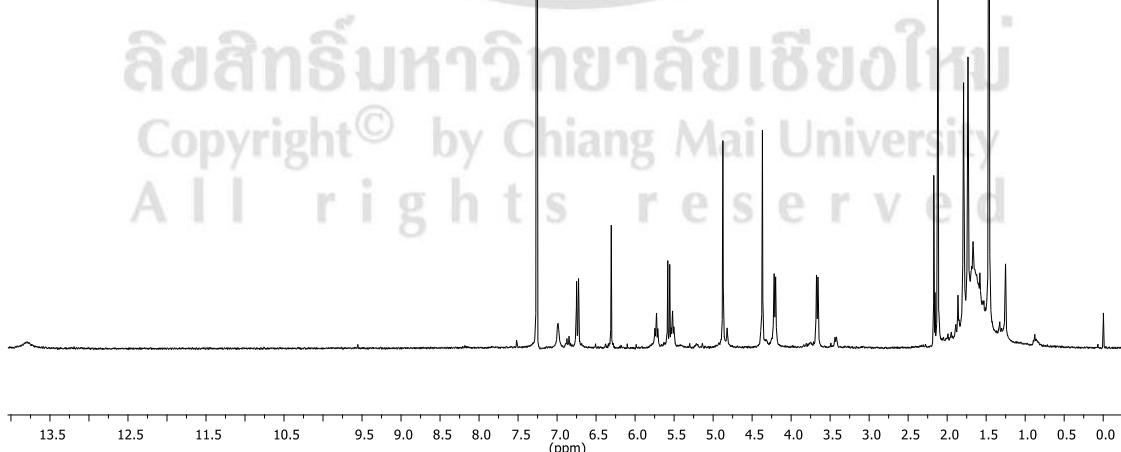
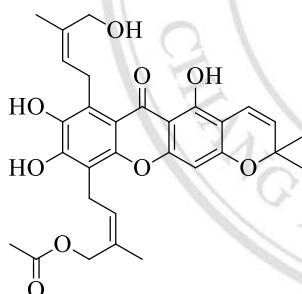
**Single Mass Analysis**

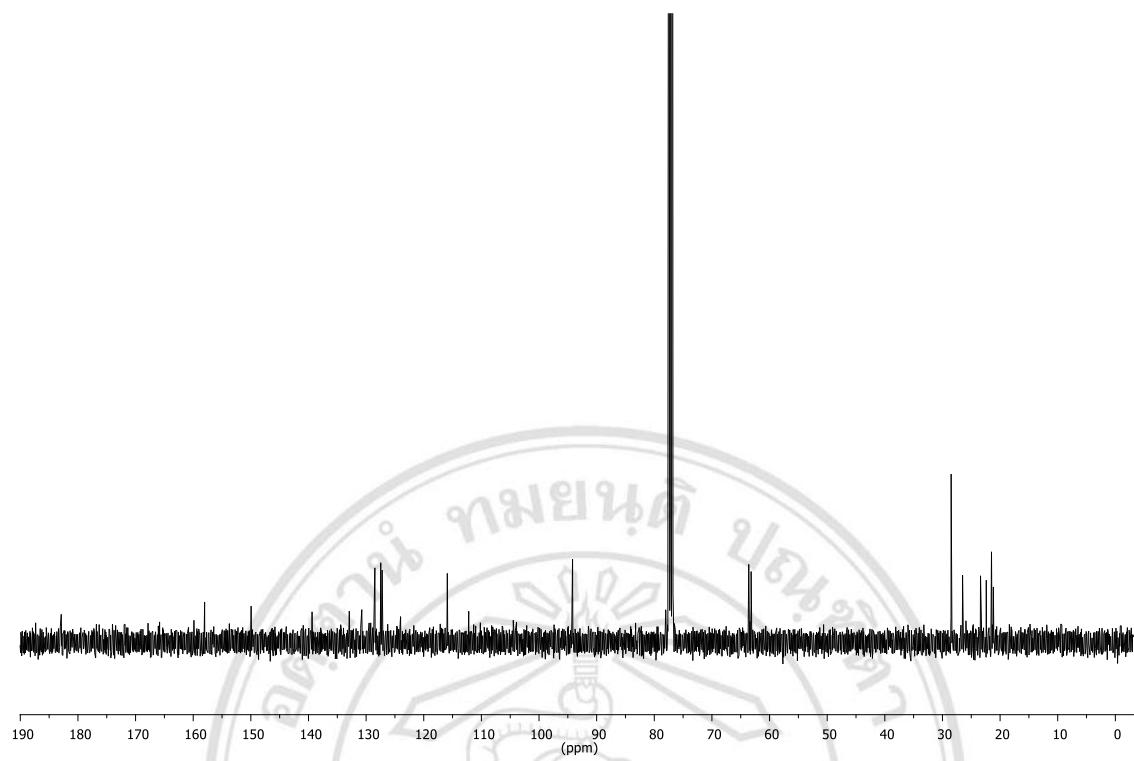
Tolerance = 5000.0 PPM / DBE: min = -1.5, max = 50.0

Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

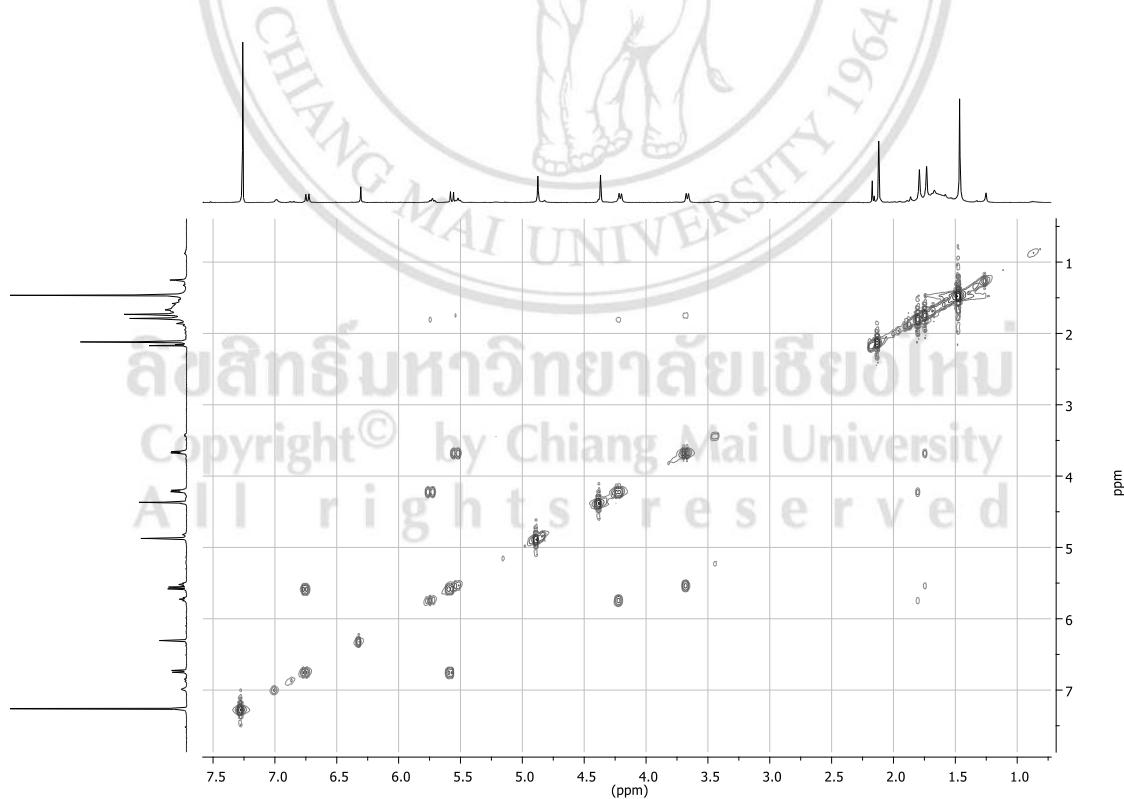
Monoisotopic Mass, Odd and Even Electron Ions

1 formula(e) evaluated with 1 results within limits (up to 50 closest results for each mass)

**Figure 22 HRESI-MS Spectrum of GML4****Figure 23 <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) Spectrum of GML5**



**Figure 24**  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) Spectrum of **GML5**



**Figure 25** COSY Spectrum of **GML5** in  $\text{CDCl}_3$

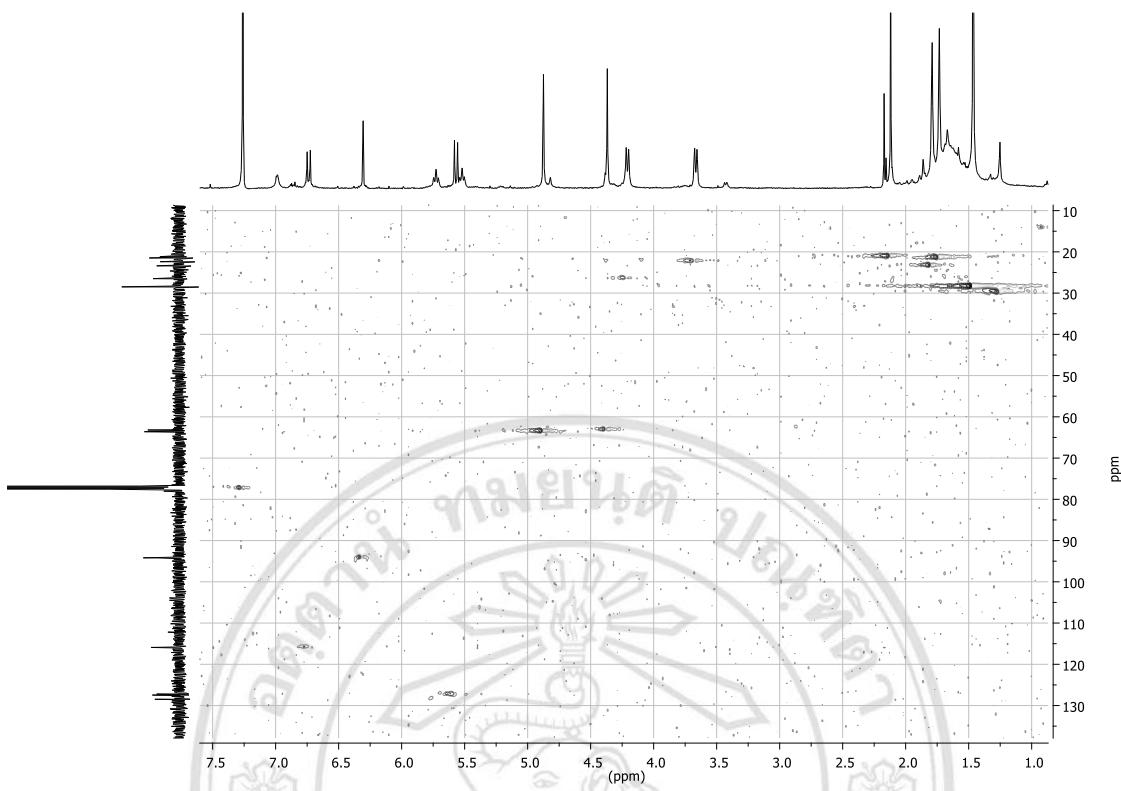


Figure 26 HMQC Spectrum of GML5 in  $\text{CDCl}_3$

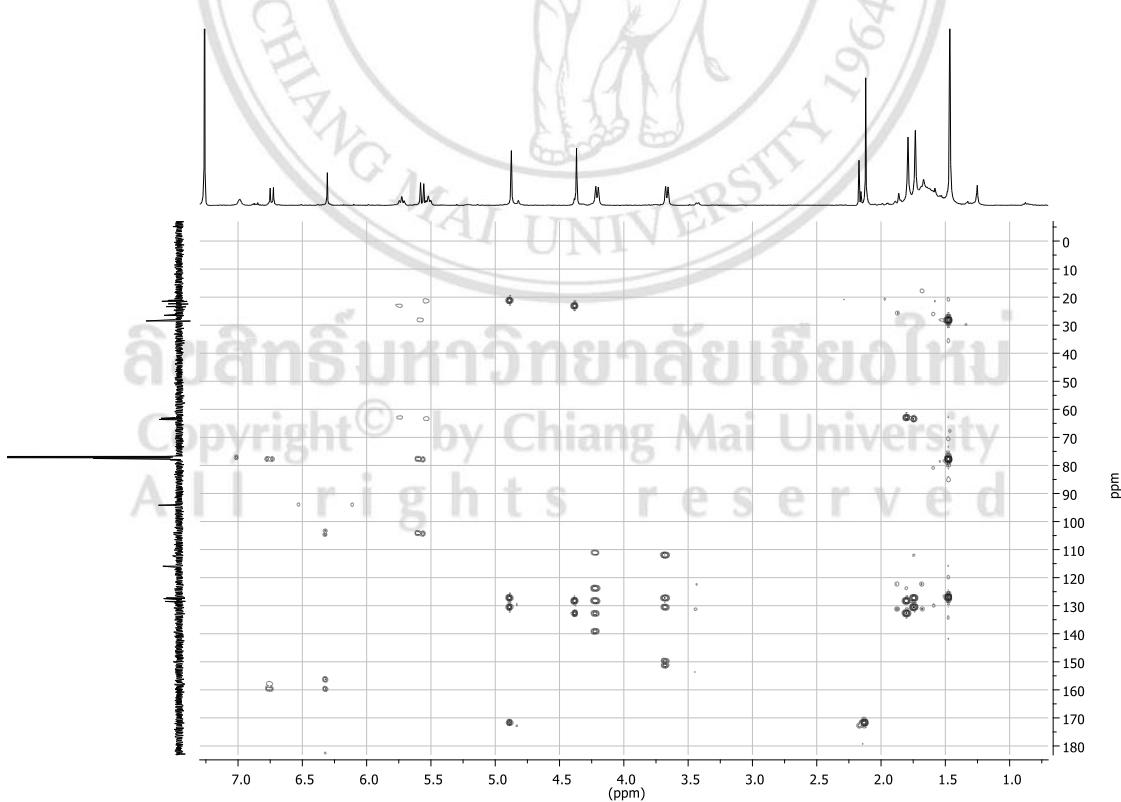


Figure 27 HMBC Spectrum of GML5 in  $\text{CDCl}_3$

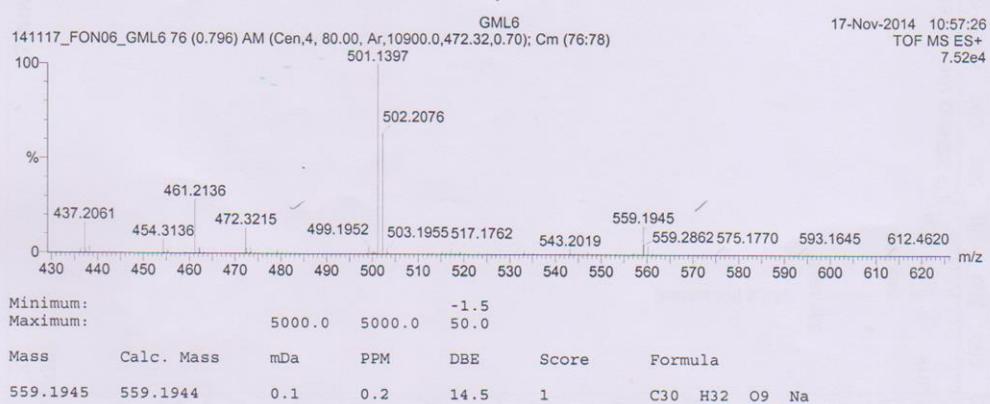
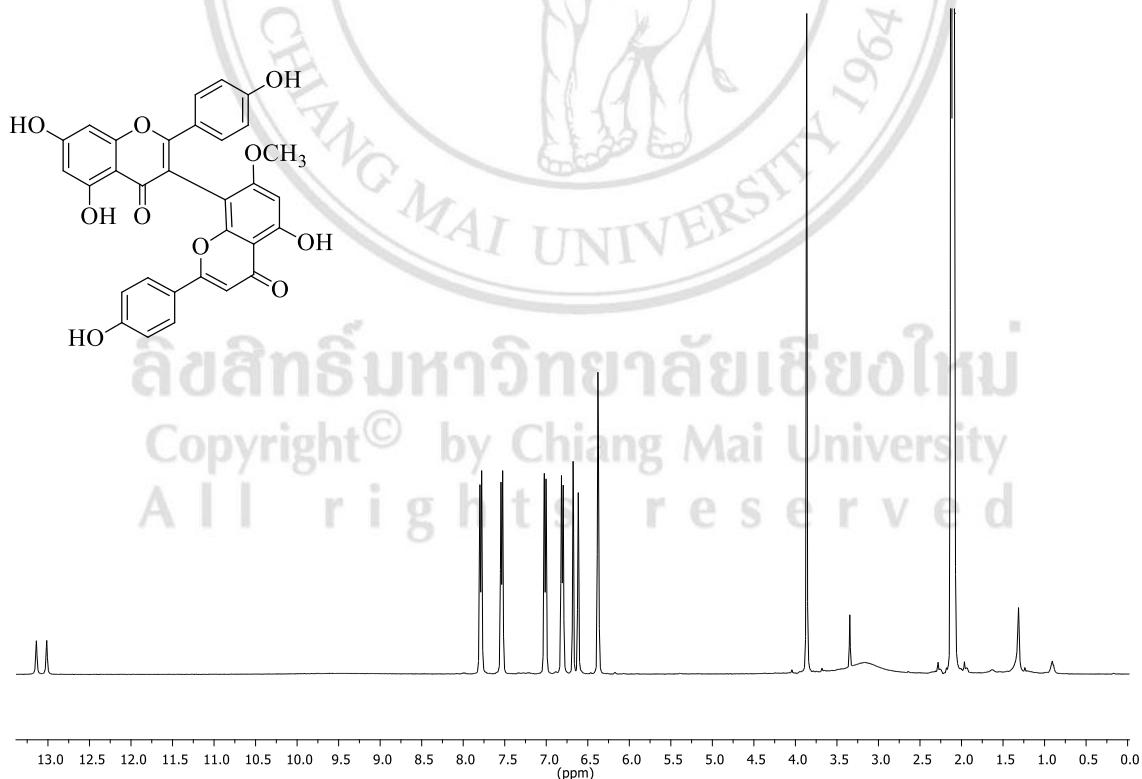
**Single Mass Analysis**

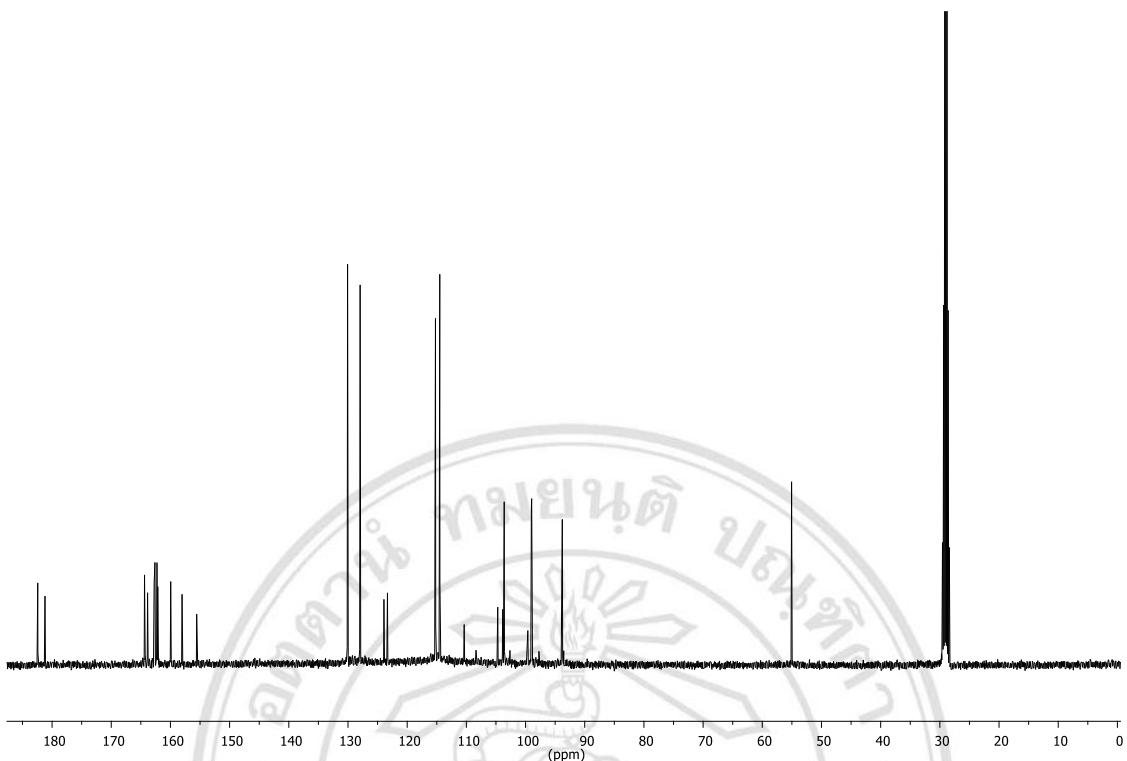
Tolerance = 5000.0 PPM / DBE: min = -1.5, max = 50.0

Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

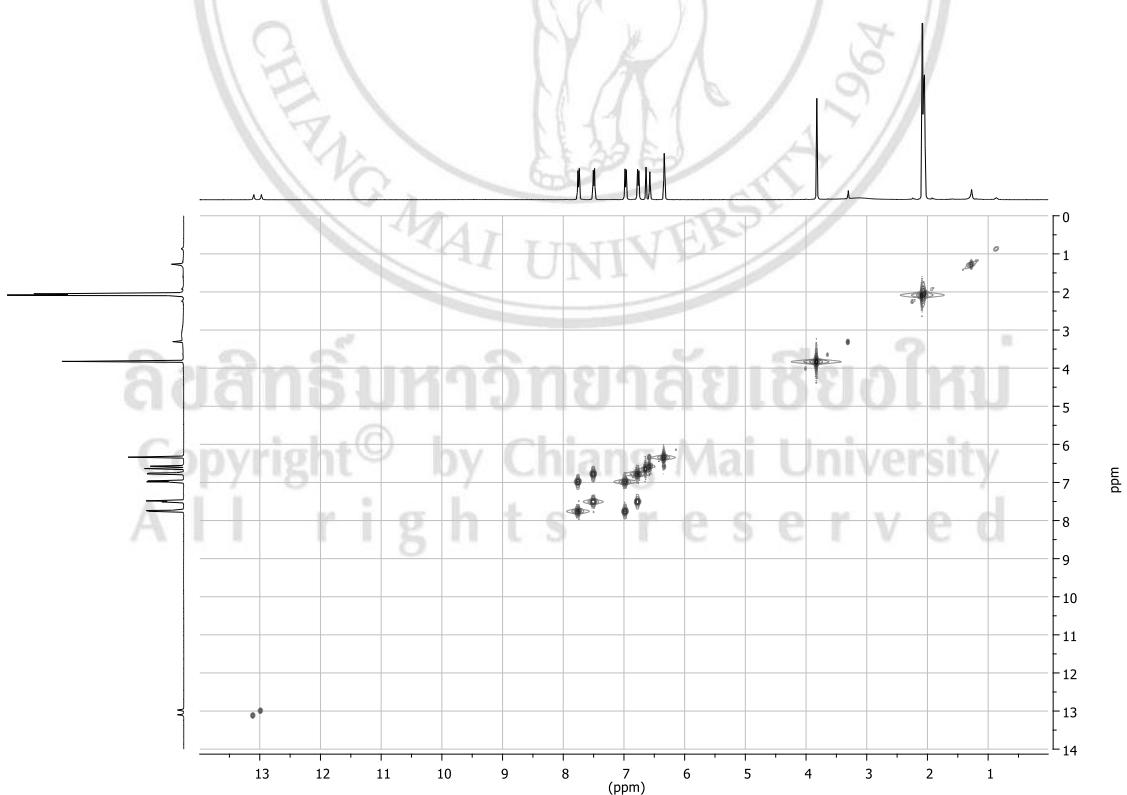
Monoisotopic Mass, Odd and Even Electron Ions

1 formula(e) evaluated with 1 results within limits (up to 50 closest results for each mass)

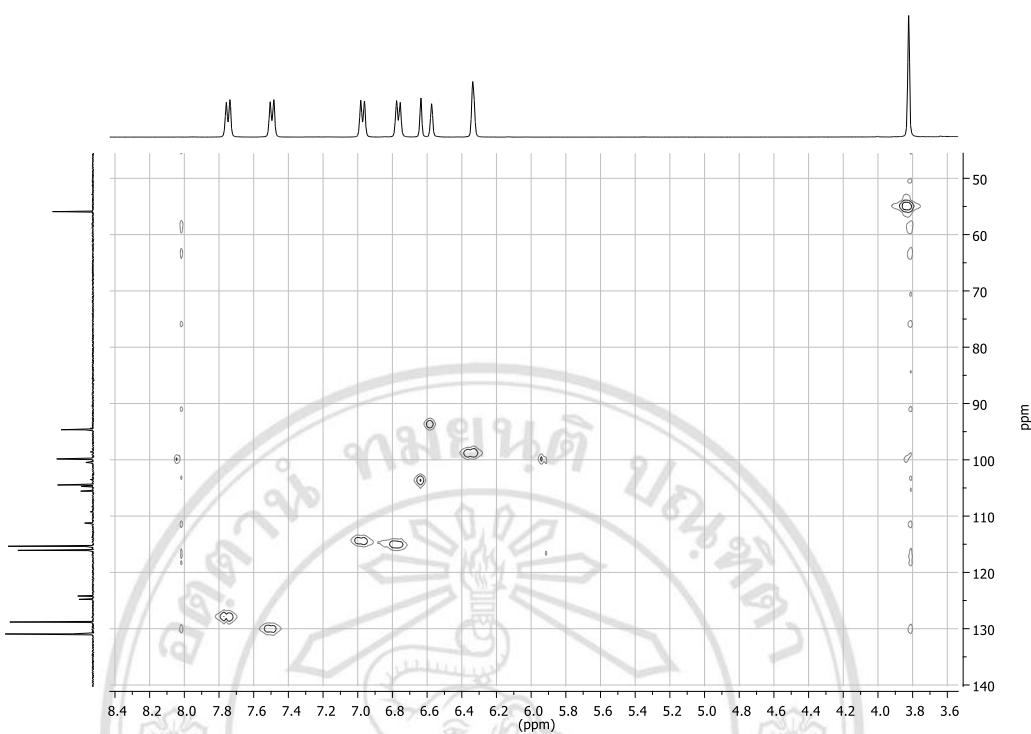
**Figure 28** HRESI-MS Spectrum of **GML5****Figure 29** <sup>1</sup>H NMR (400 MHz, Acetone-d<sub>6</sub>) Spectrum of **GML6**



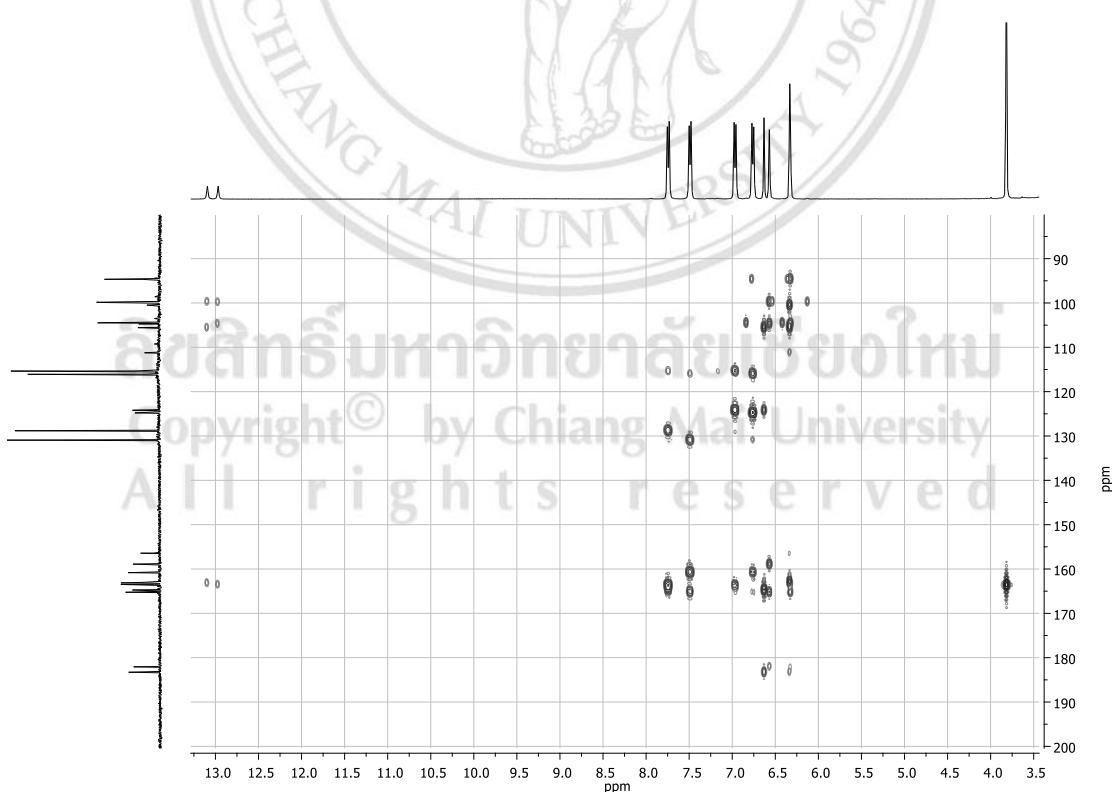
**Figure 30**  $^{13}\text{C}$  NMR (100 MHz, Acetone- $d_6$ ) Spectrum of GML6



**Figure 31** COSY Spectrum of GML6 in Acetone- $d_6$



**Figure 32** HMQC Spectrum of **GML6** in Acetone-*d*<sub>6</sub>



**Figure 33** HMBC Spectrum of **GML6** in Acetone-*d*<sub>6</sub>

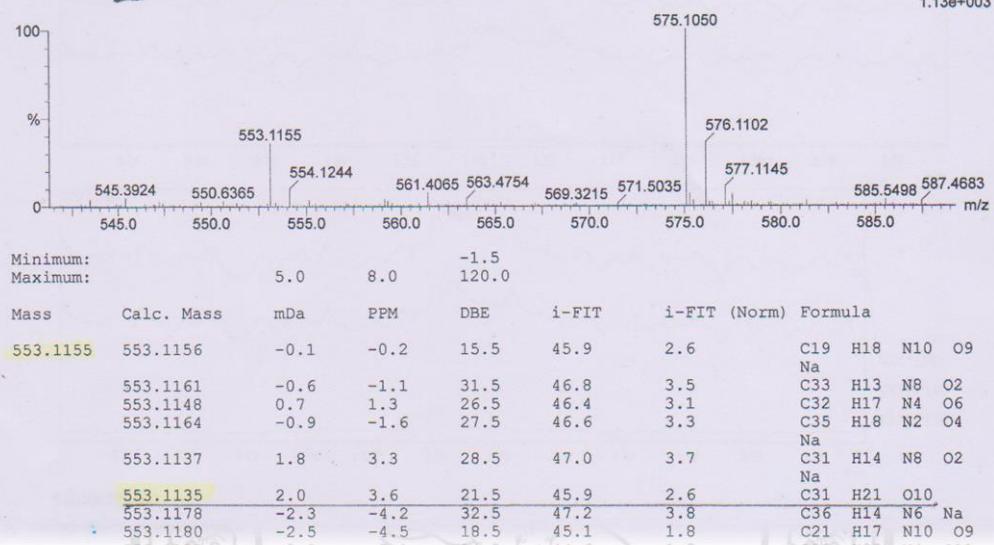
**Single Mass Analysis**

Tolerance = 8.0 PPM / DBE: min = -1.5, max = 120.0  
 Element prediction: Off  
 Number of isotope peaks used for i-FIT = 3

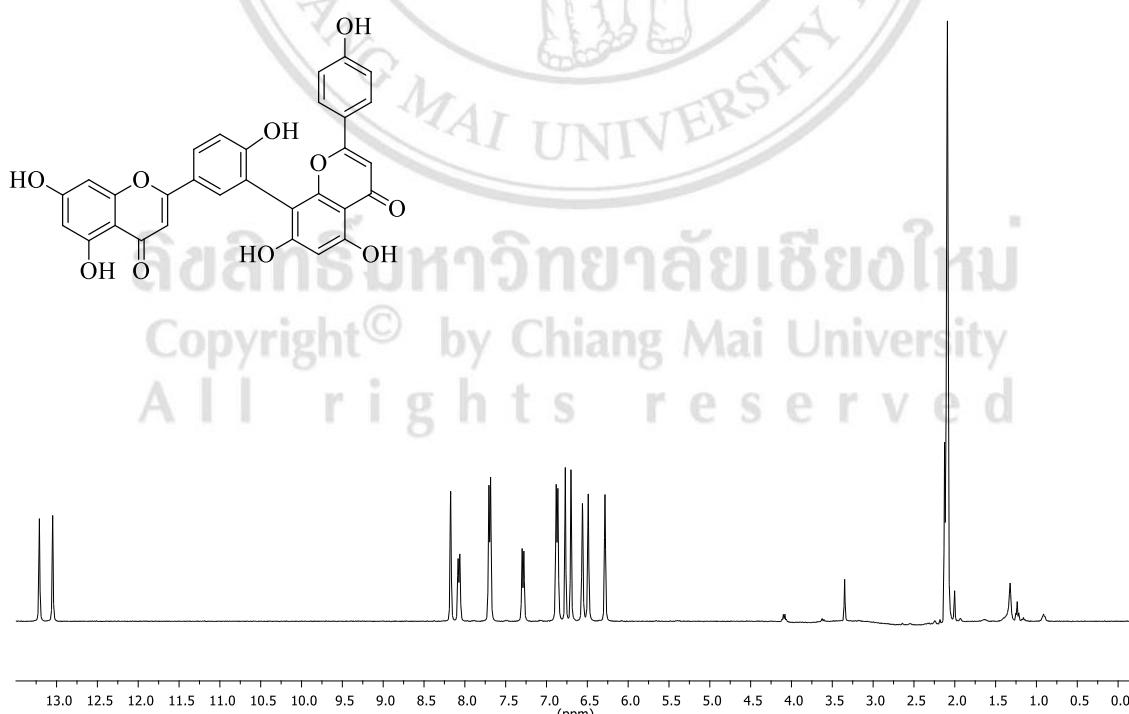
Monoisotopic Mass, Even Electron Ions  
 1541 formula(e) evaluated with 13 results within limits (up to 20 closest results for each mass)

Elements Used:  
 C: 8-40 H: 0-70 N: 0-10 O: 0-12 Na: 0-1  
 GM 4  
 SP Thanaphat GM 4 87 (2.071) AM2 (Ar,8000.0,0.00,0.57); ABS; Cm (87)

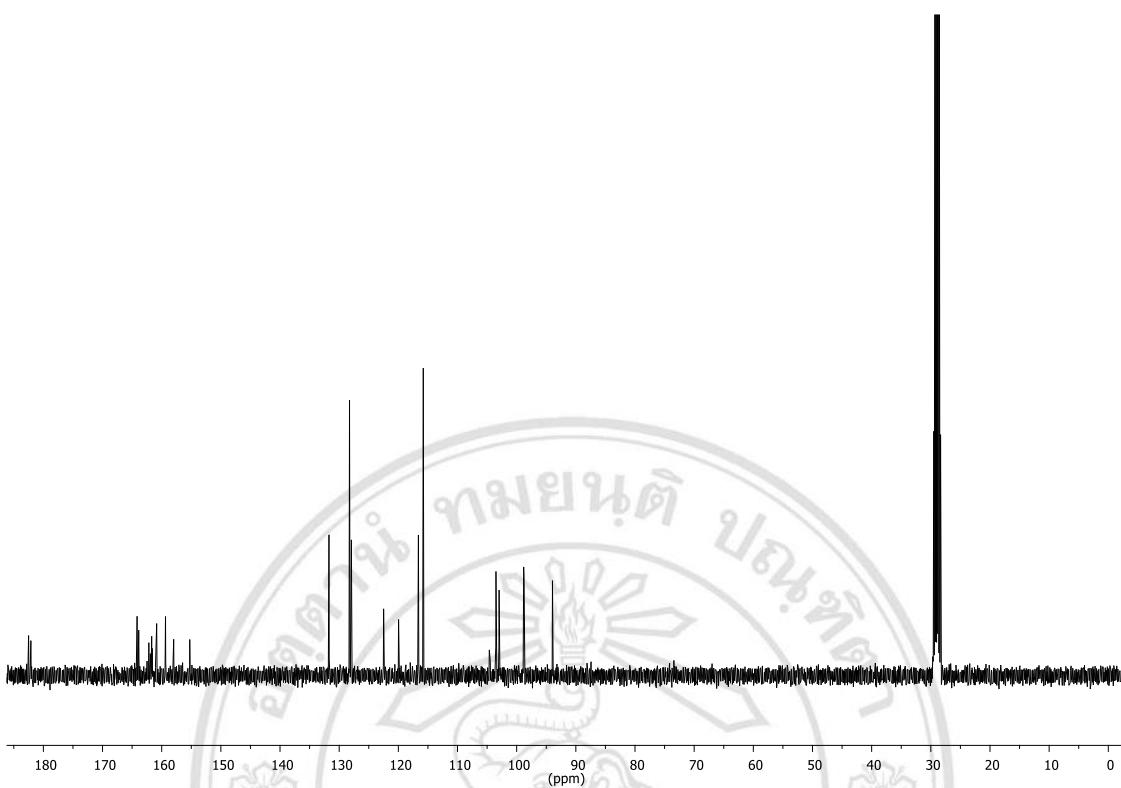
1: TOF MS ES+  
 1.13e+003



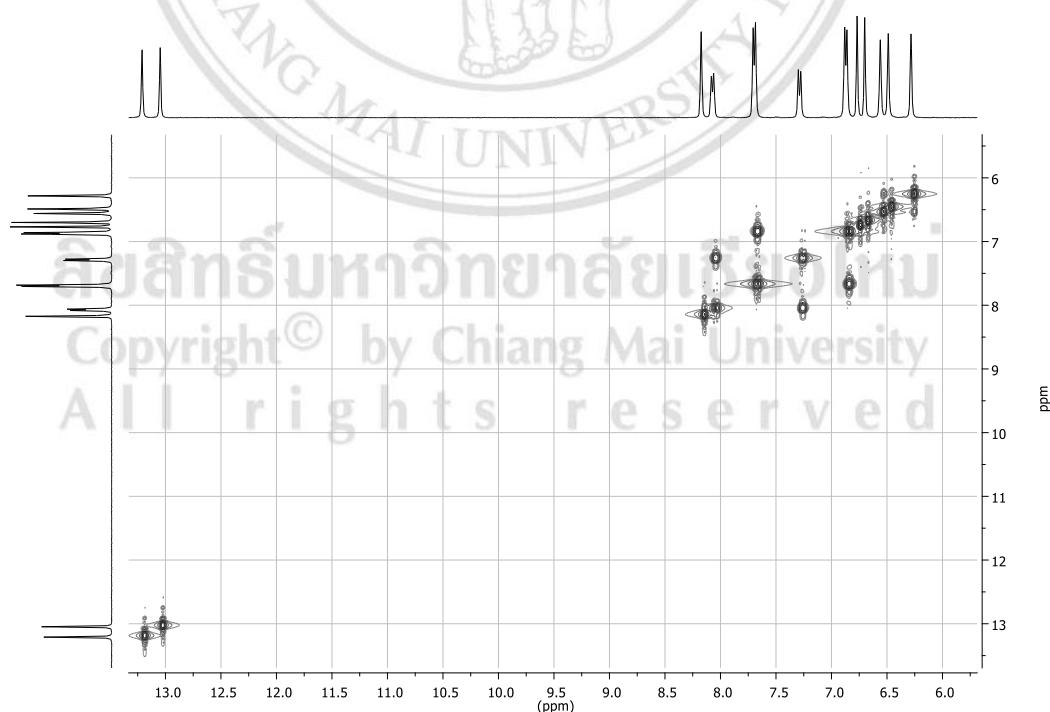
**Figure 34** HRESI-MS Spectrum of GML6



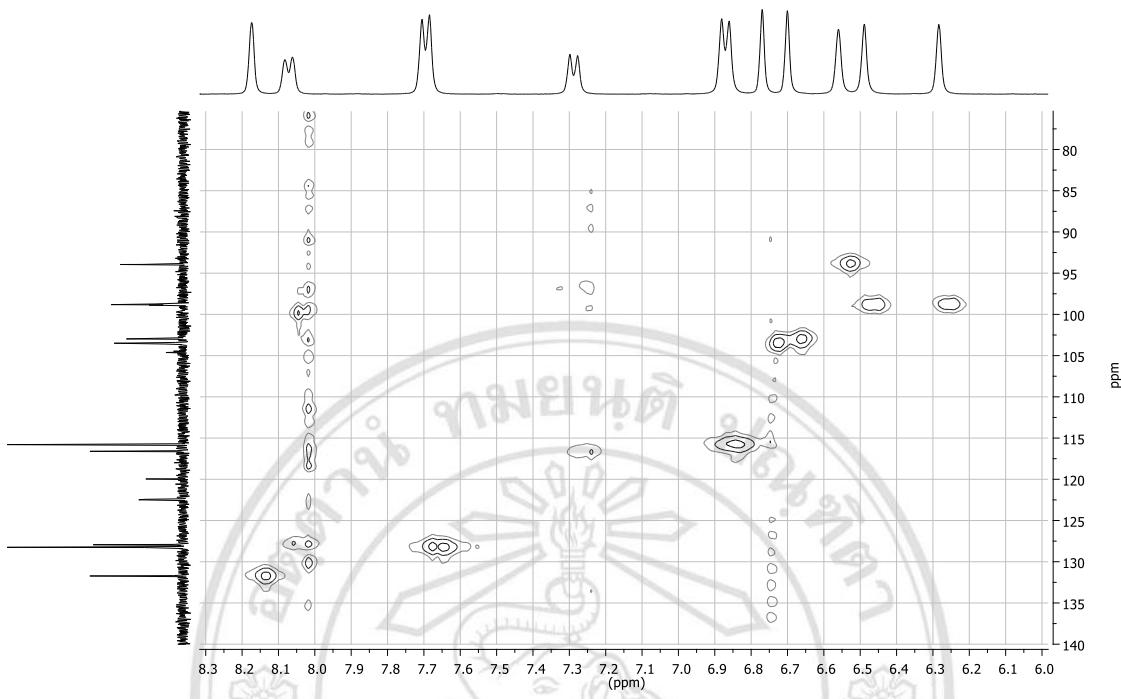
**Figure 35** <sup>1</sup>H NMR (400 MHz, Acetone-*d*<sub>6</sub>) Spectrum of GML7



**Figure 36**  $^{13}\text{C}$  NMR (100 MHz, Acetone- $d_6$ ) Spectrum of **GML7**



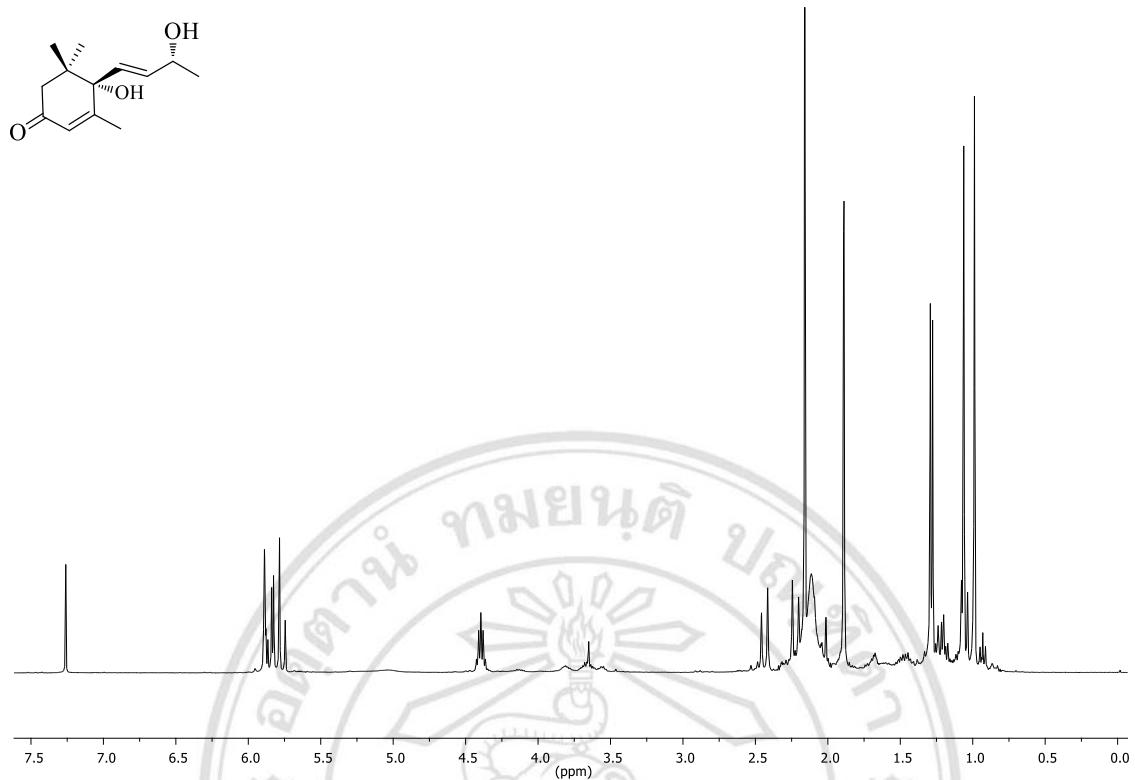
**Figure 37** COSY Spectrum of **GML7** in Acetone- $d_6$



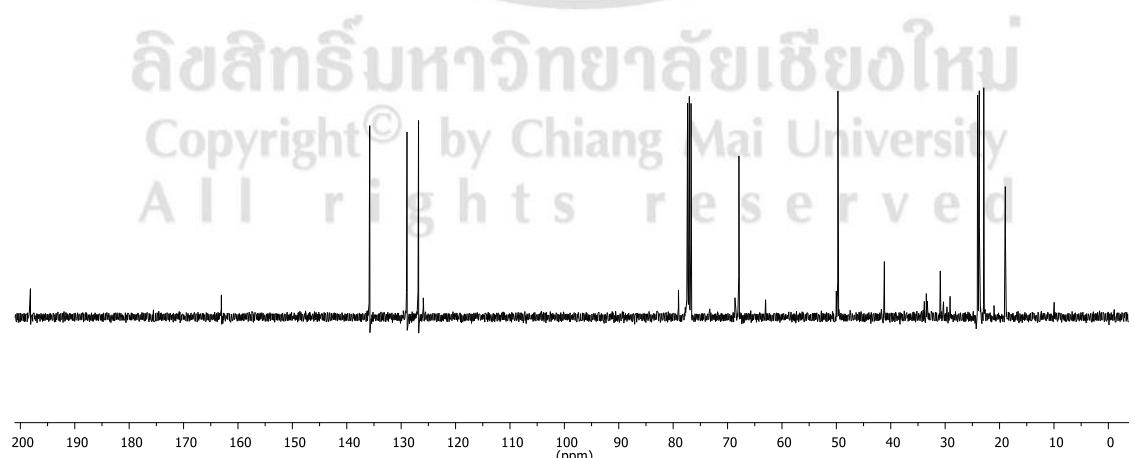
**Figure 38** HMQC Spectrum of **GML7** in Acetone- $d_6$



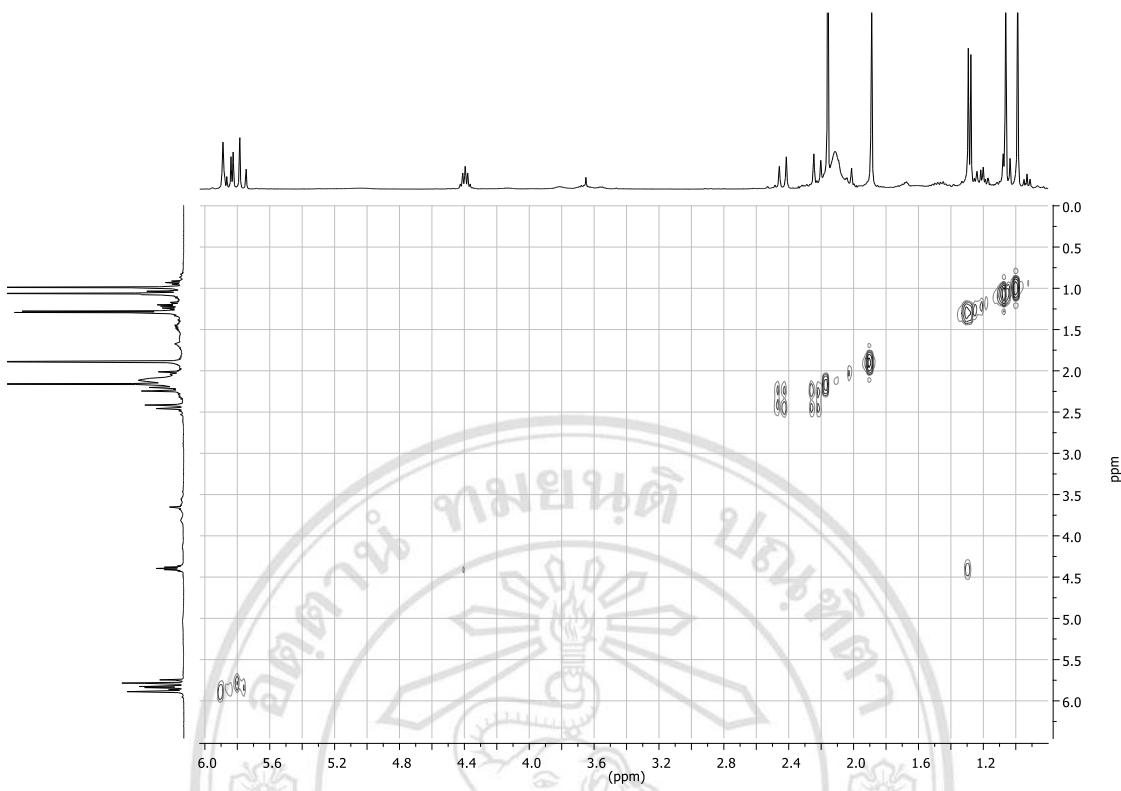
**Figure 39** HMBC Spectrum of **GML7** in Acetone- $d_6$



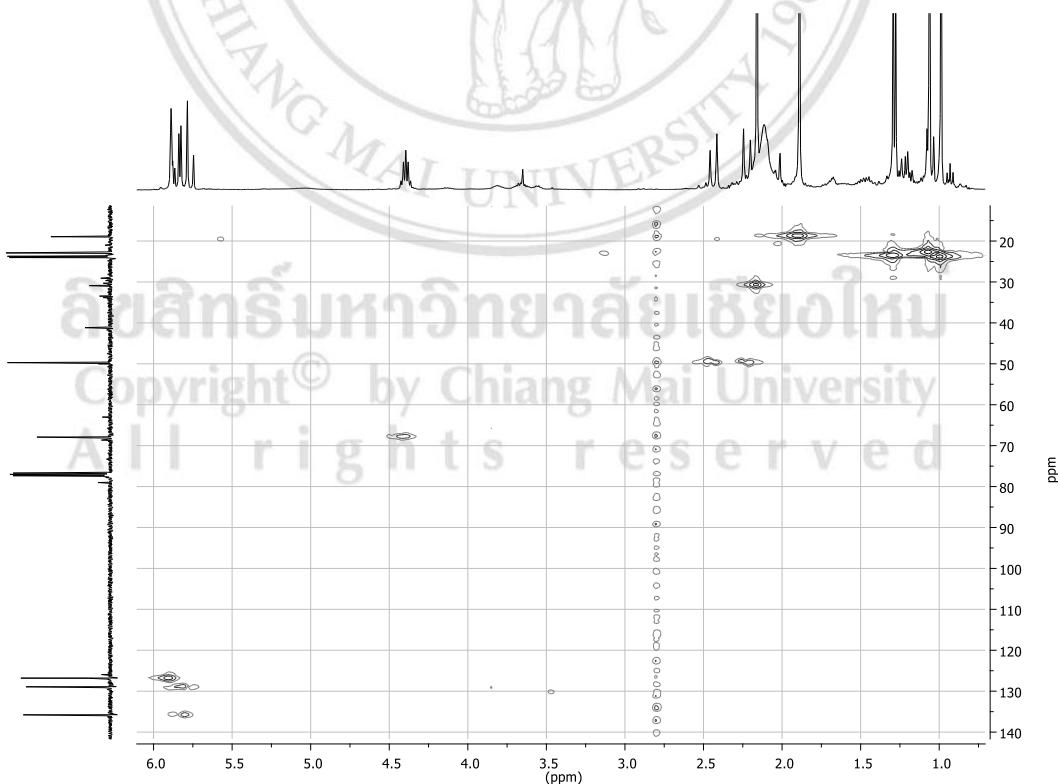
**Figure 40**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) Spectrum of **GML8**



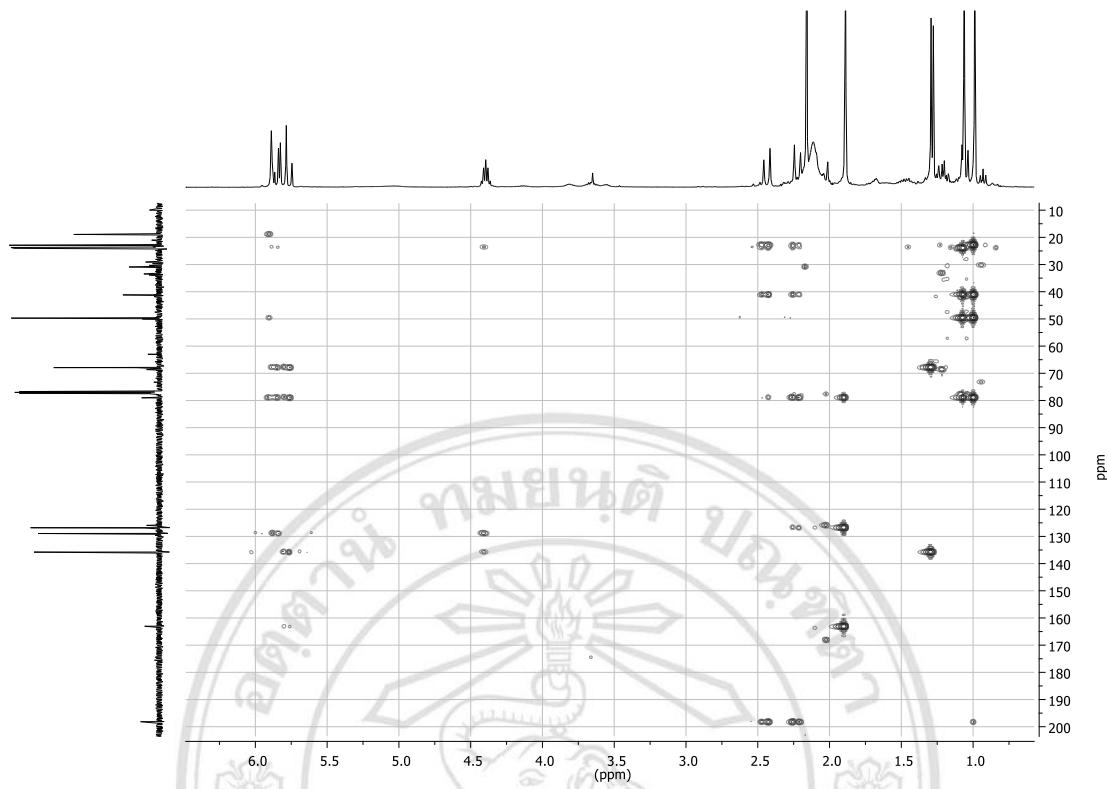
**Figure 41**  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) Spectrum of **GML8**



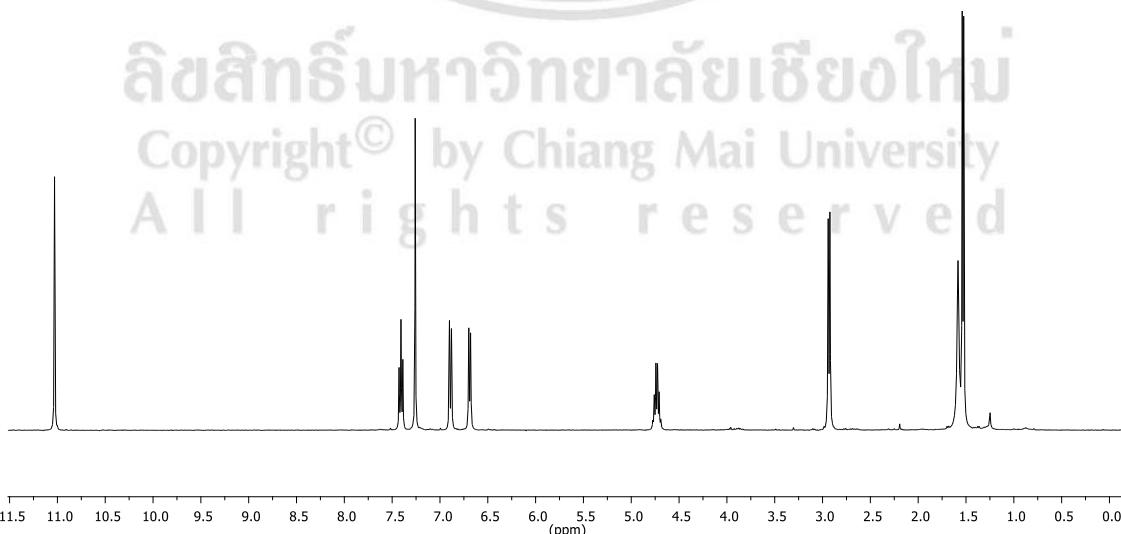
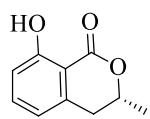
**Figure 42** COSY Spectrum of **GML8** in  $\text{CDCl}_3$



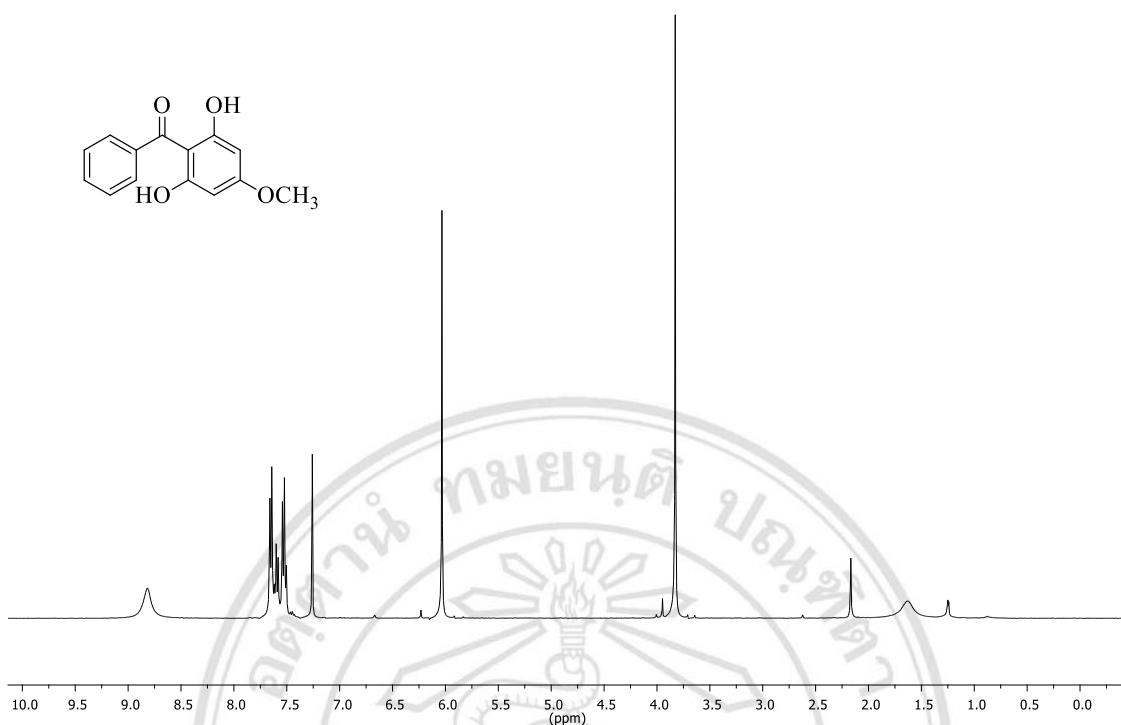
**Figure 43** HMQC Spectrum of **GML8** in  $\text{CDCl}_3$



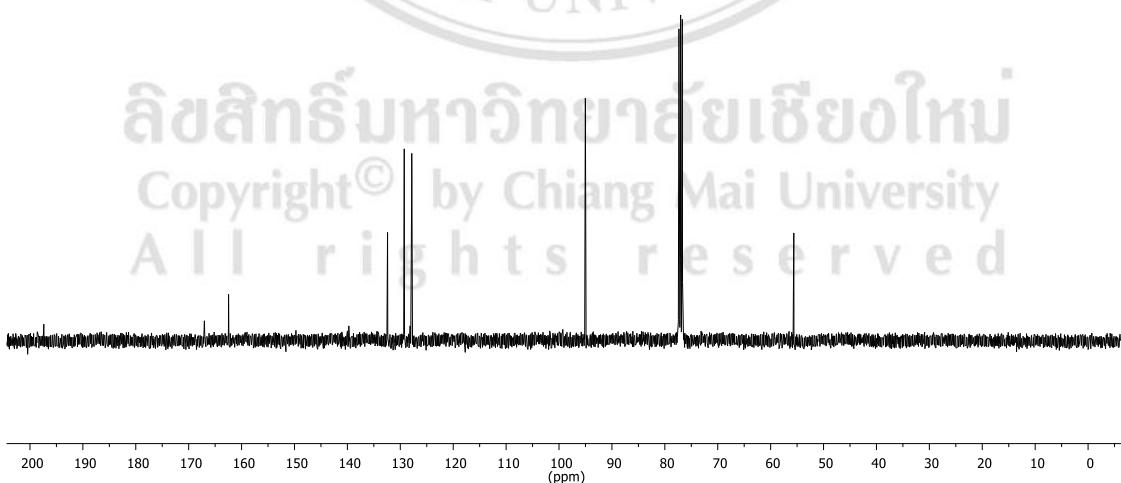
**Figure 44** HMBC Spectrum of **GML8** in  $\text{CDCl}_3$



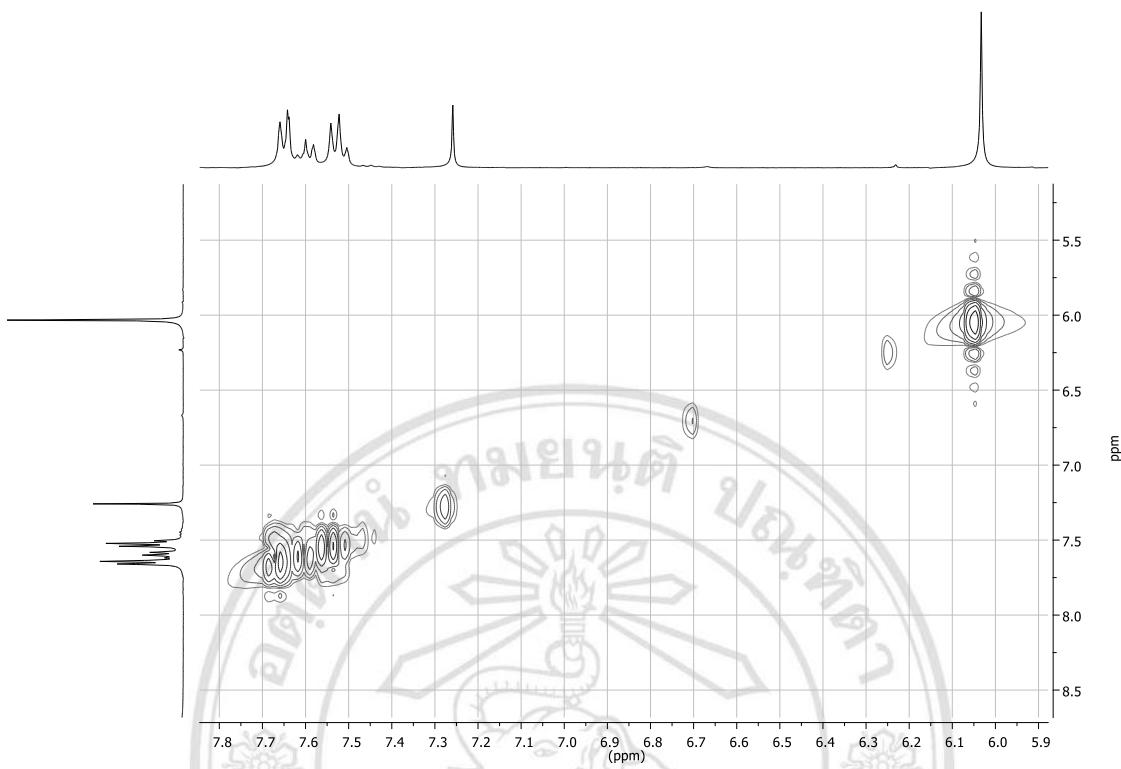
**Figure 45**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) Spectrum of **GMB1**



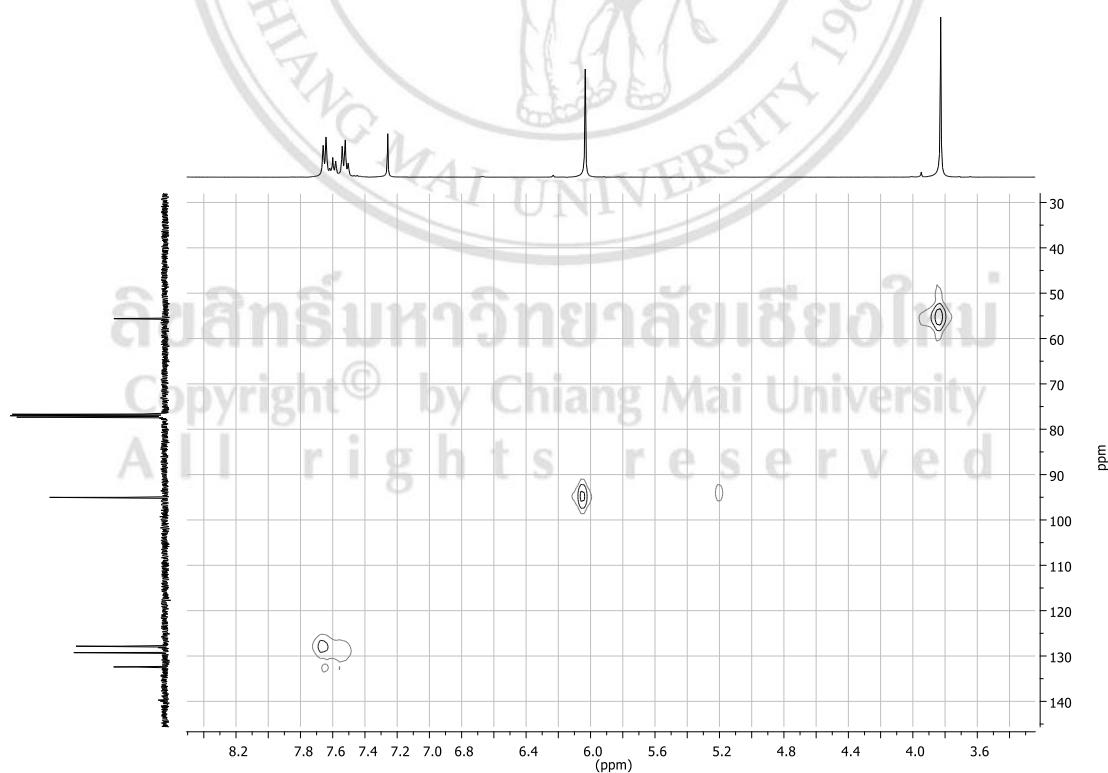
**Figure 46**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) Spectrum of **GMB2**



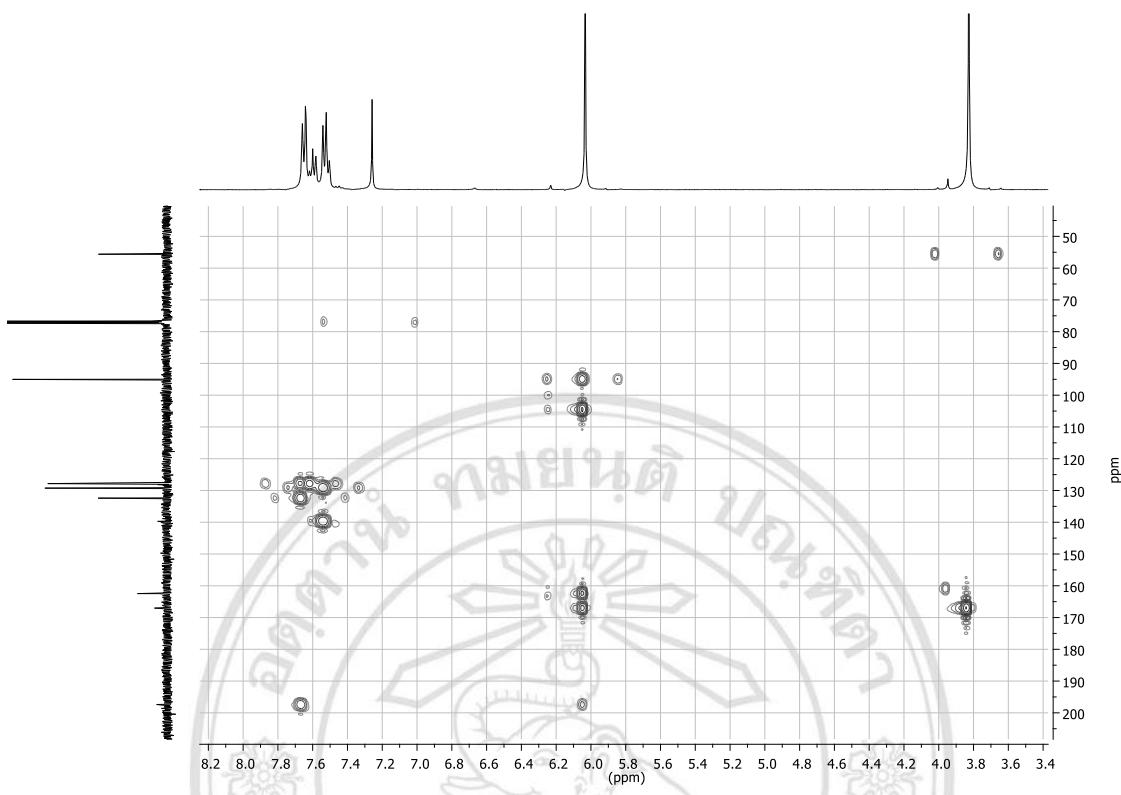
**Figure 47**  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) Spectrum of **GMB2**



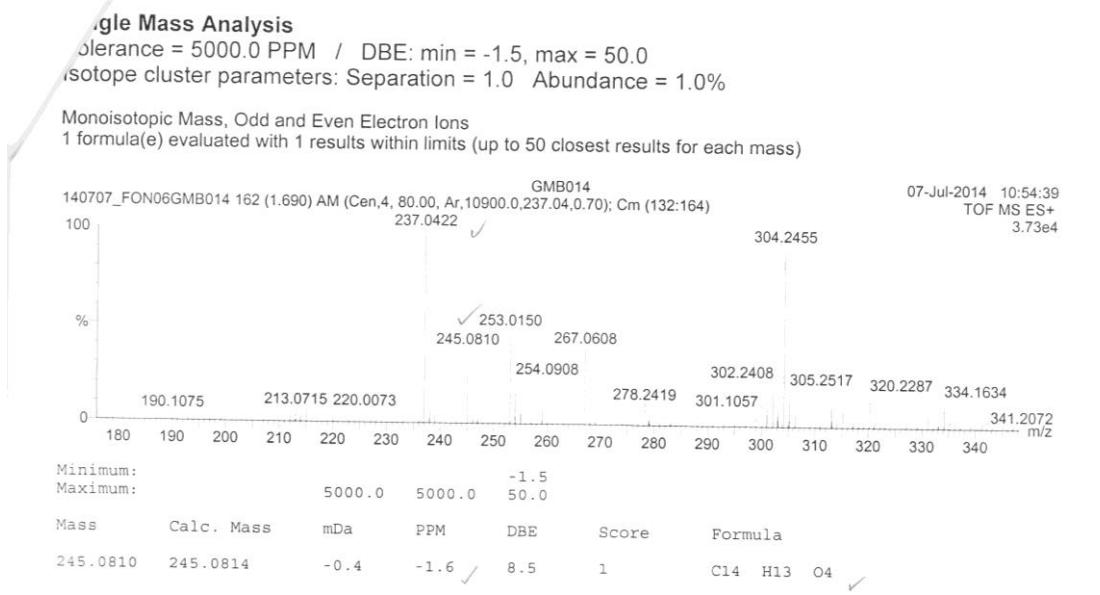
**Figure 48** COSY Spectrum of **GMB2** in  $\text{CDCl}_3$



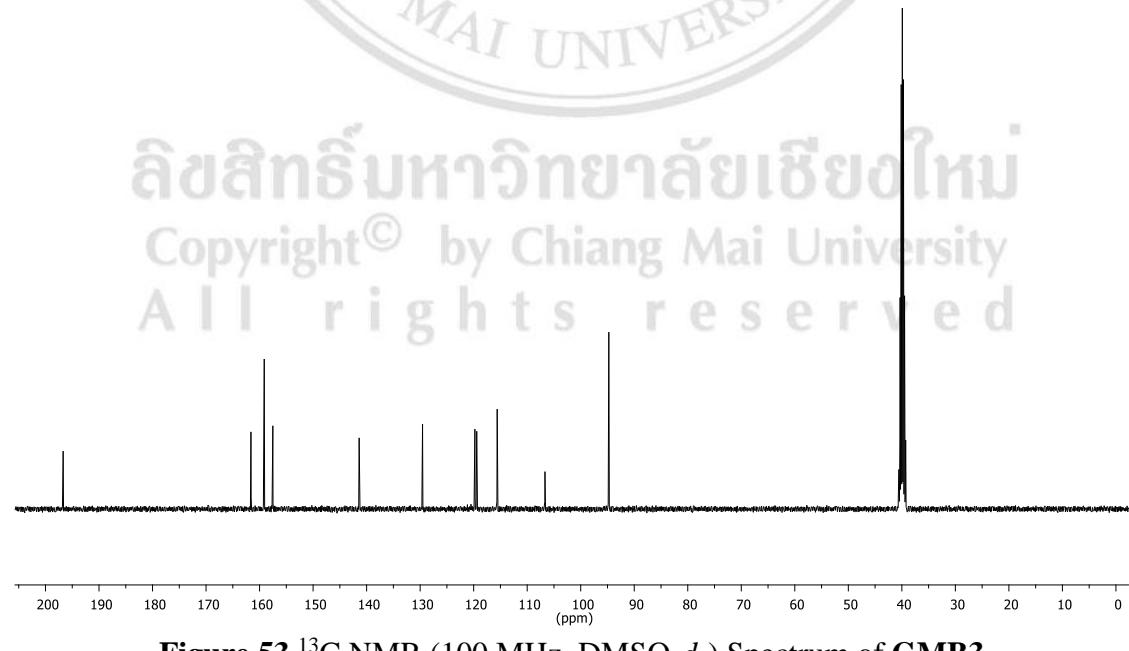
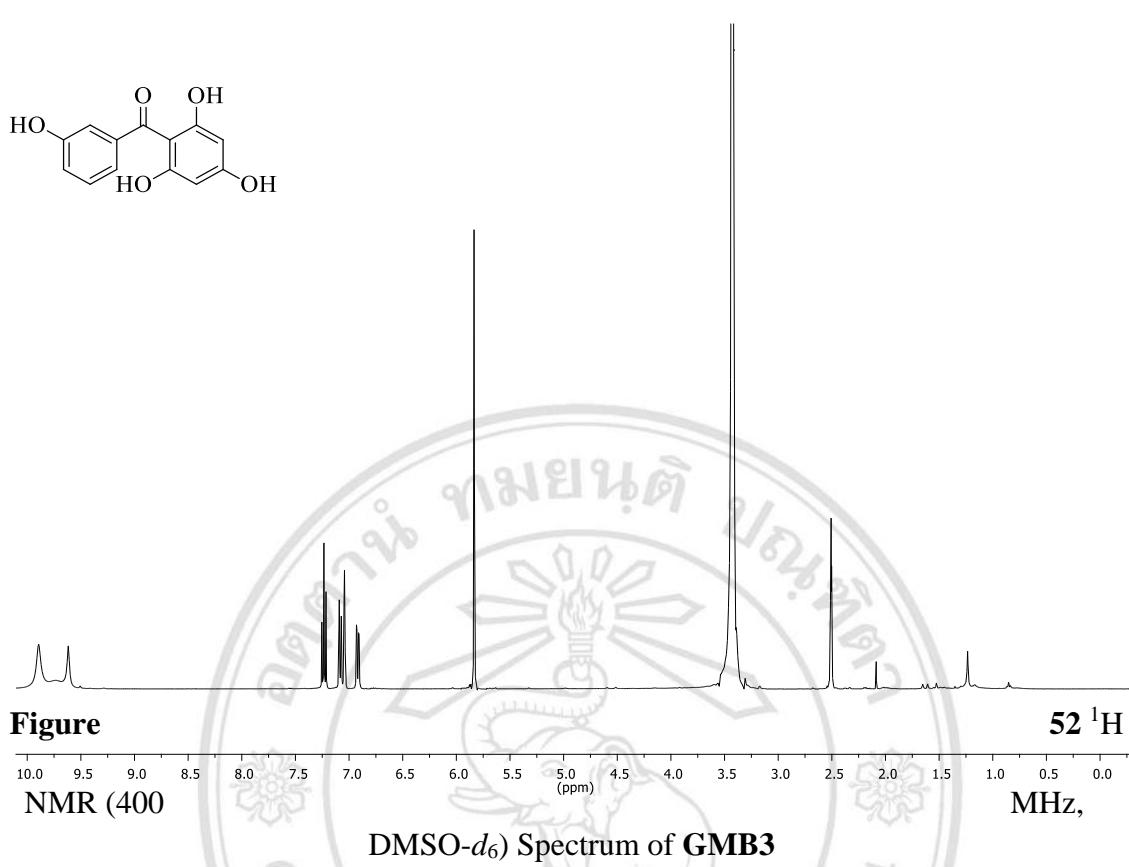
**Figure 49** HMQC Spectrum of **GMB2** in  $\text{CDCl}_3$

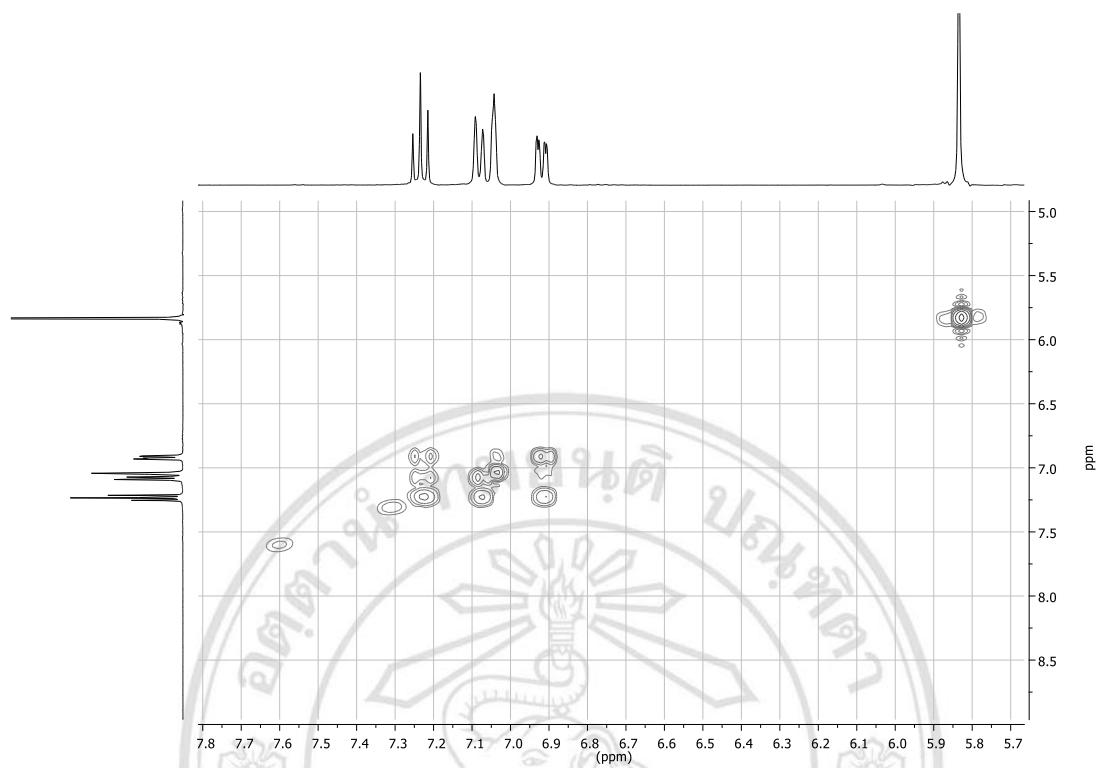


**Figure 50** HMBC Spectrum of GMB2 in  $\text{CDCl}_3$

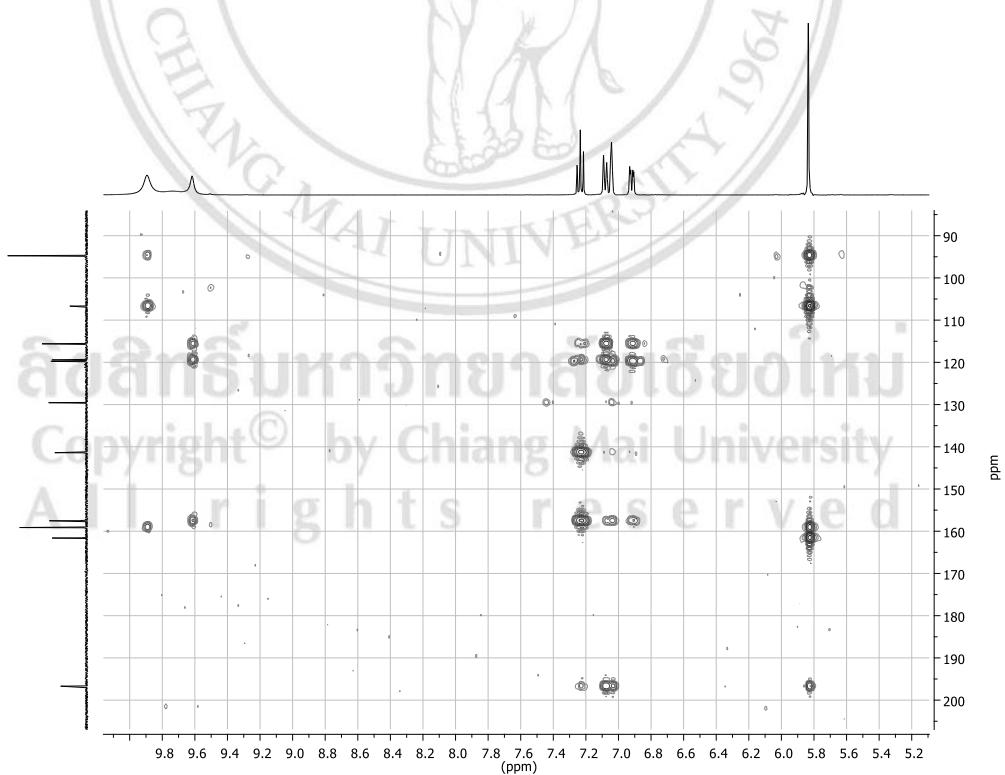


**Figure 51** HRESI-MS Spectrum of GMB2

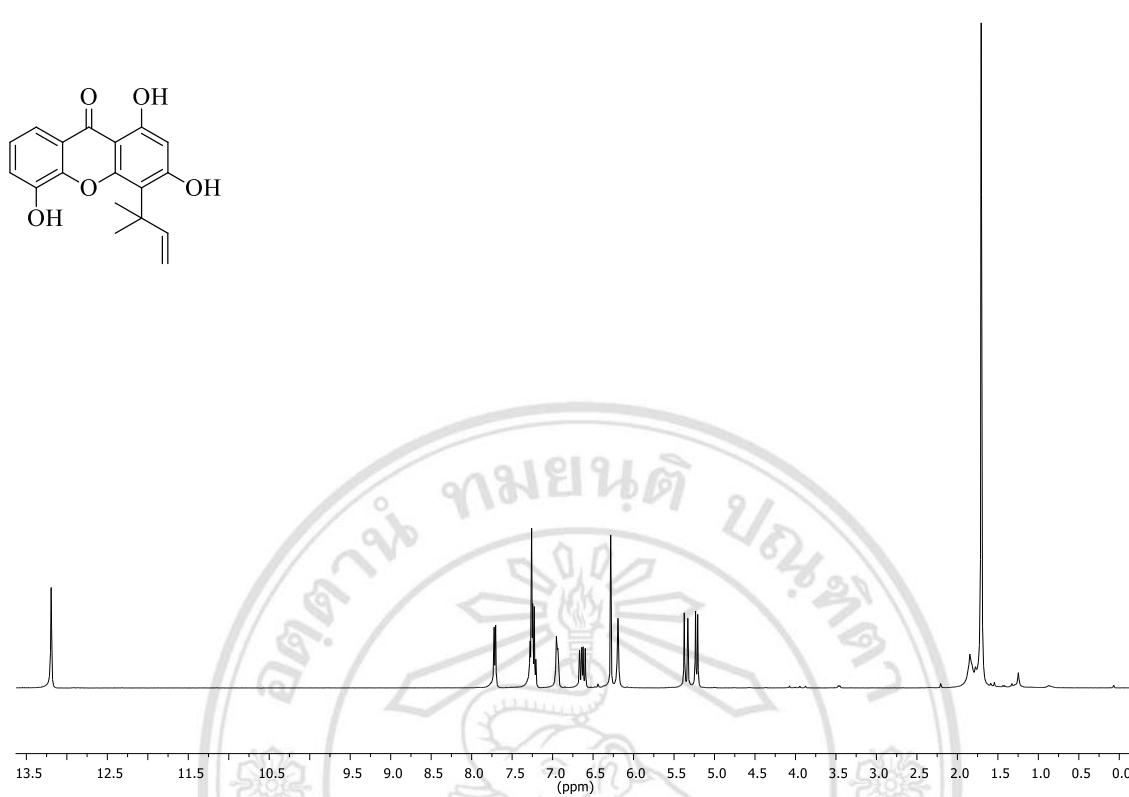




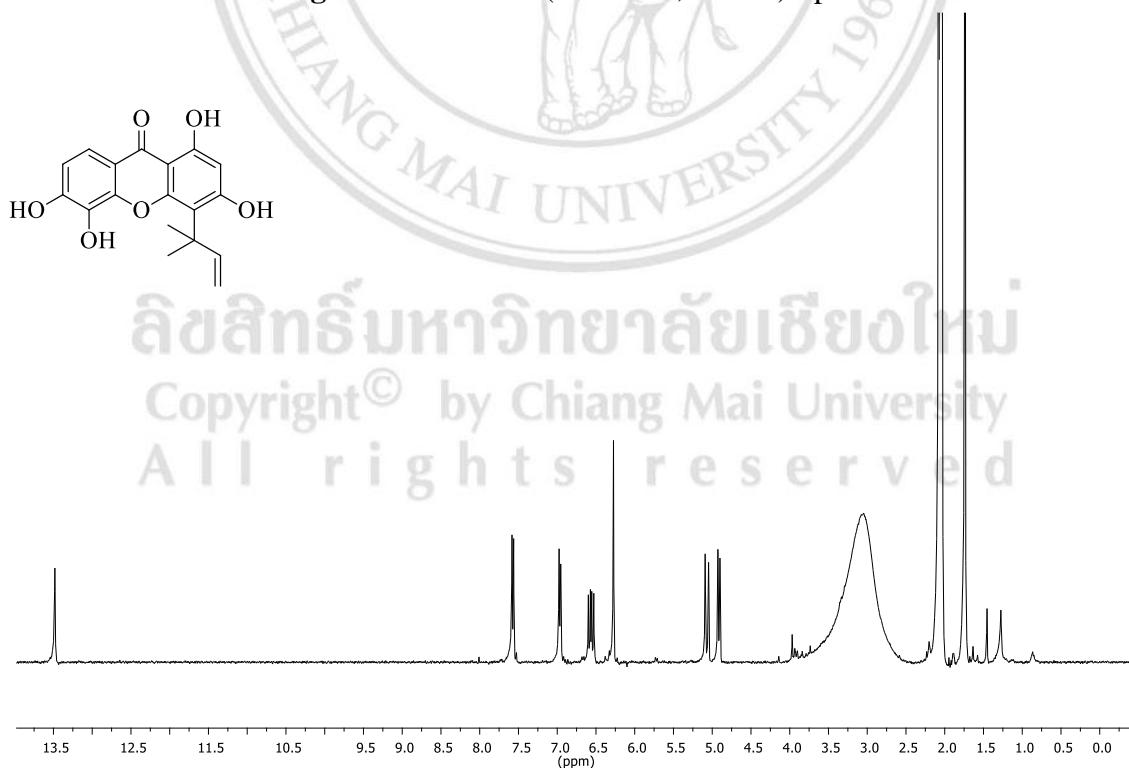
**Figure 54** COSY Spectrum of GMB3 in  $\text{DMSO}-d_6$



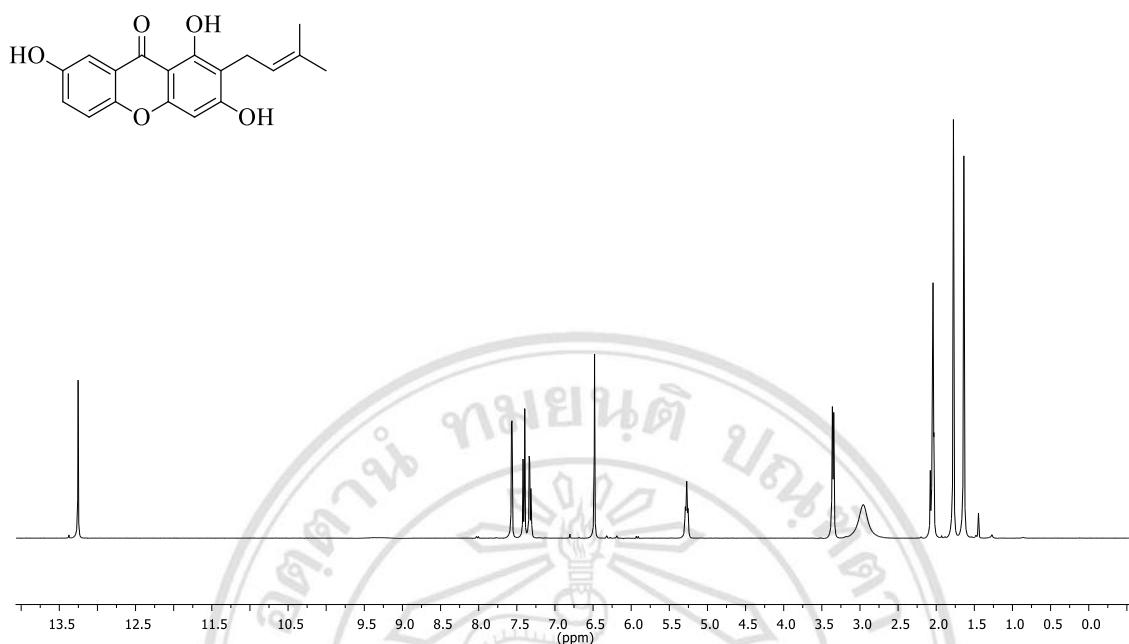
**Figure 55** HMBC Spectrum of GMB3  $\text{DMSO}-d_6$



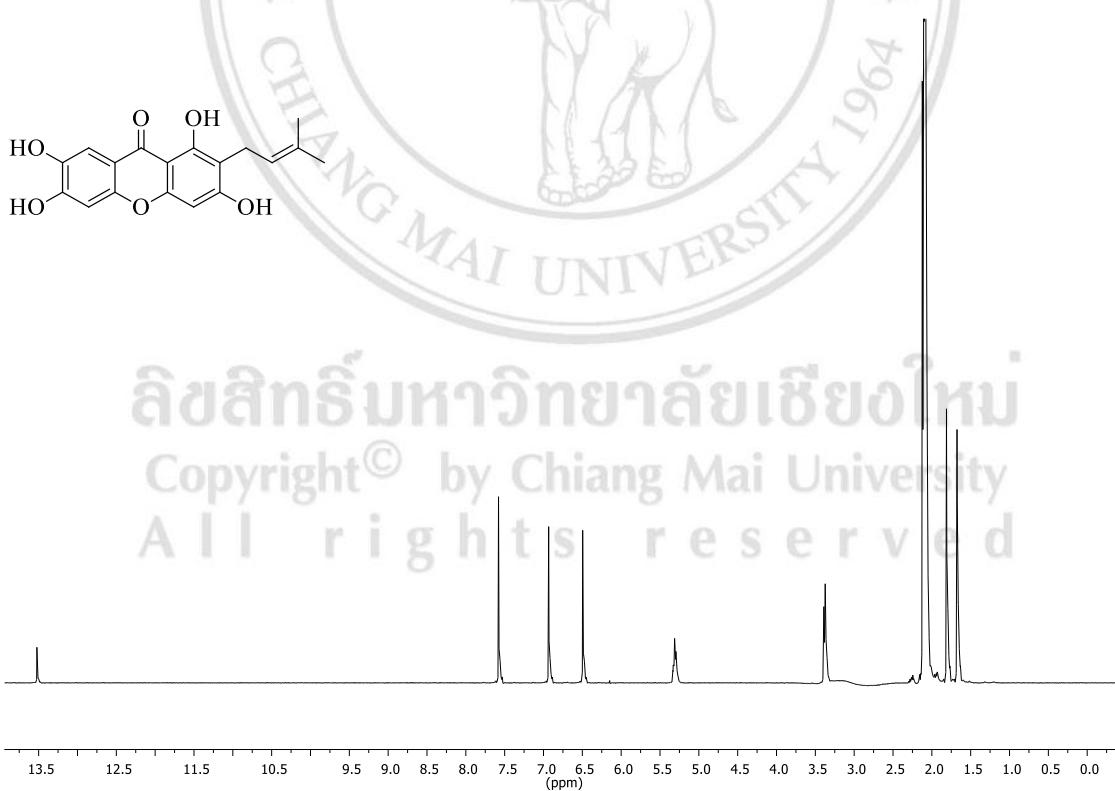
**Figure 56**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) Spectrum of **GMB4**



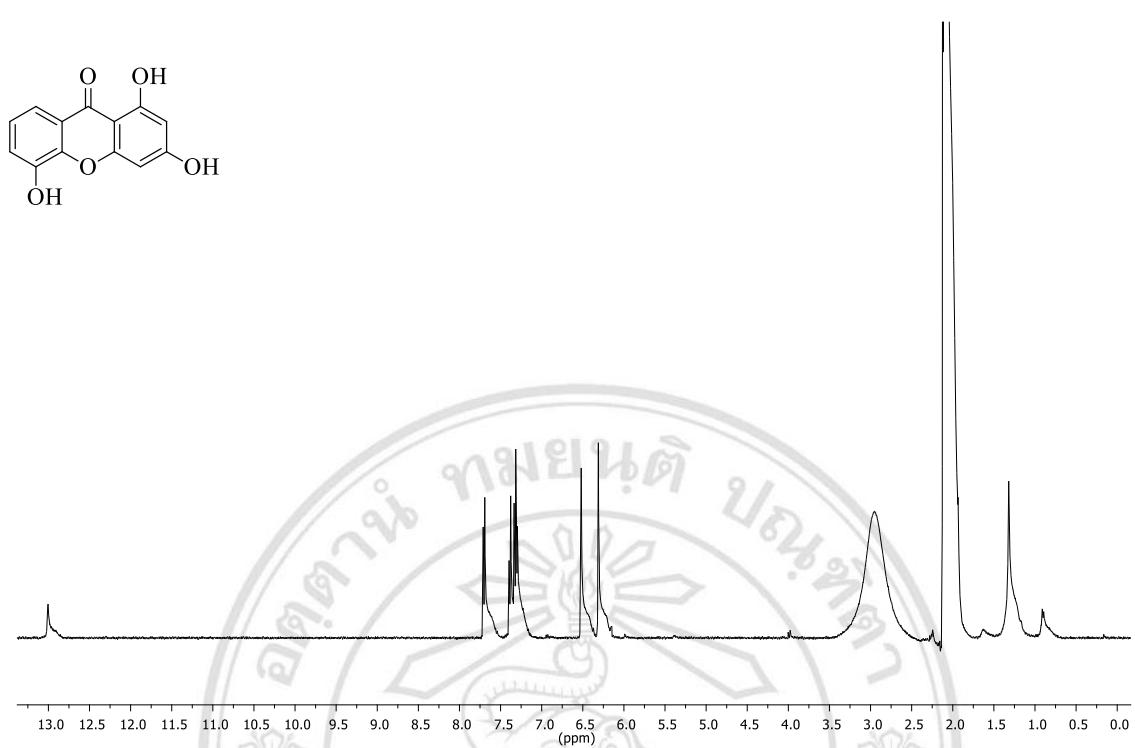
**Figure 57**  $^1\text{H}$  NMR (400 MHz, Acetone- $d_6$ ) Spectrum of **GMB5**



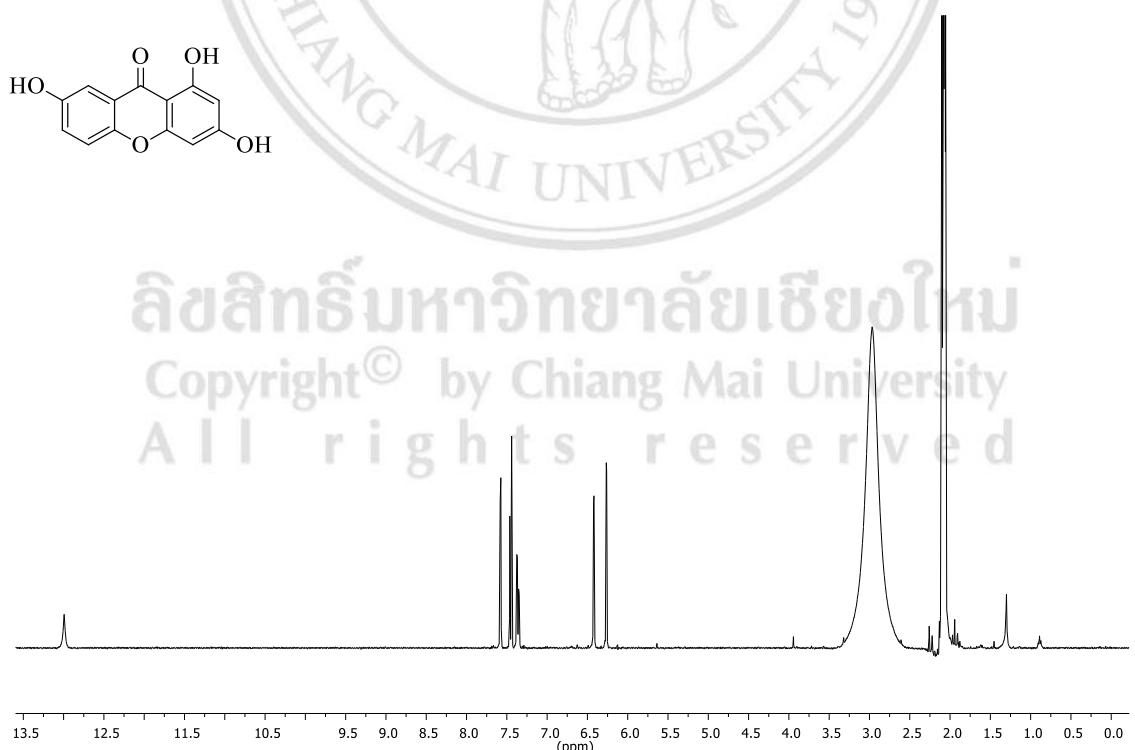
**Figure 58**  $^1\text{H}$  NMR (400 MHz, Acetone- $d_6$ ) Spectrum of **GMB6**



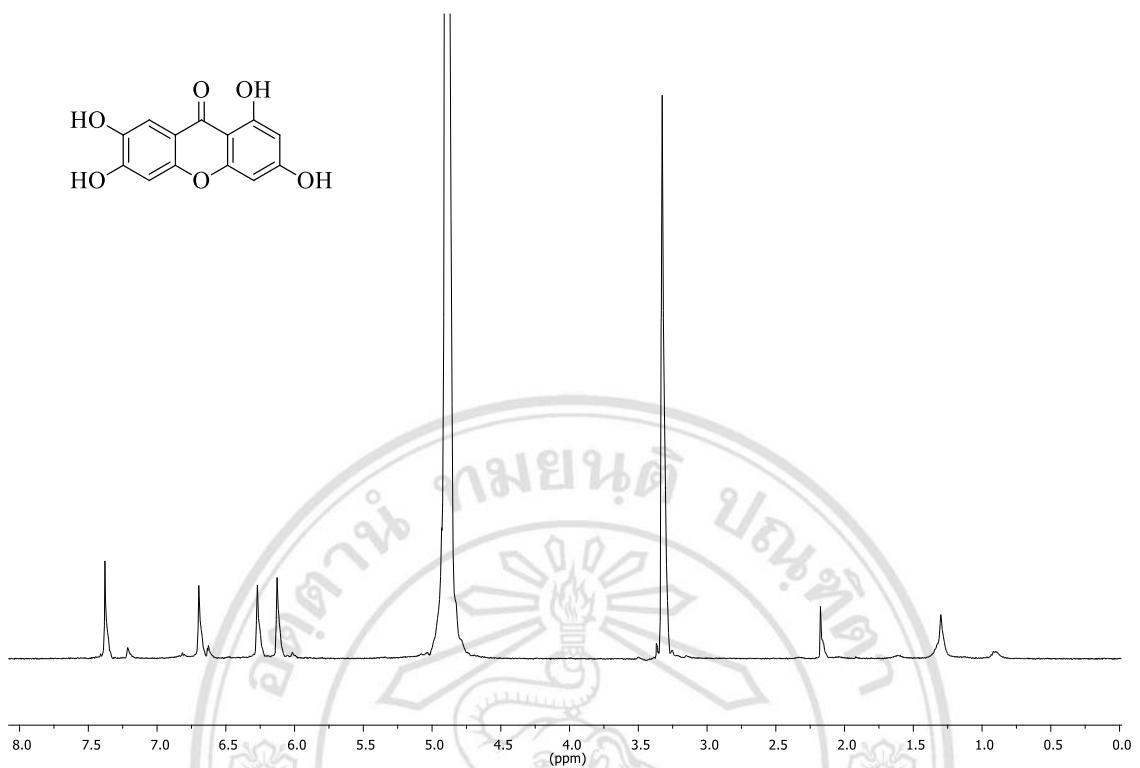
**Figure 59**  $^1\text{H}$  (400 MHz, Acetone- $d_6$ ) Spectrum of **GMB7**



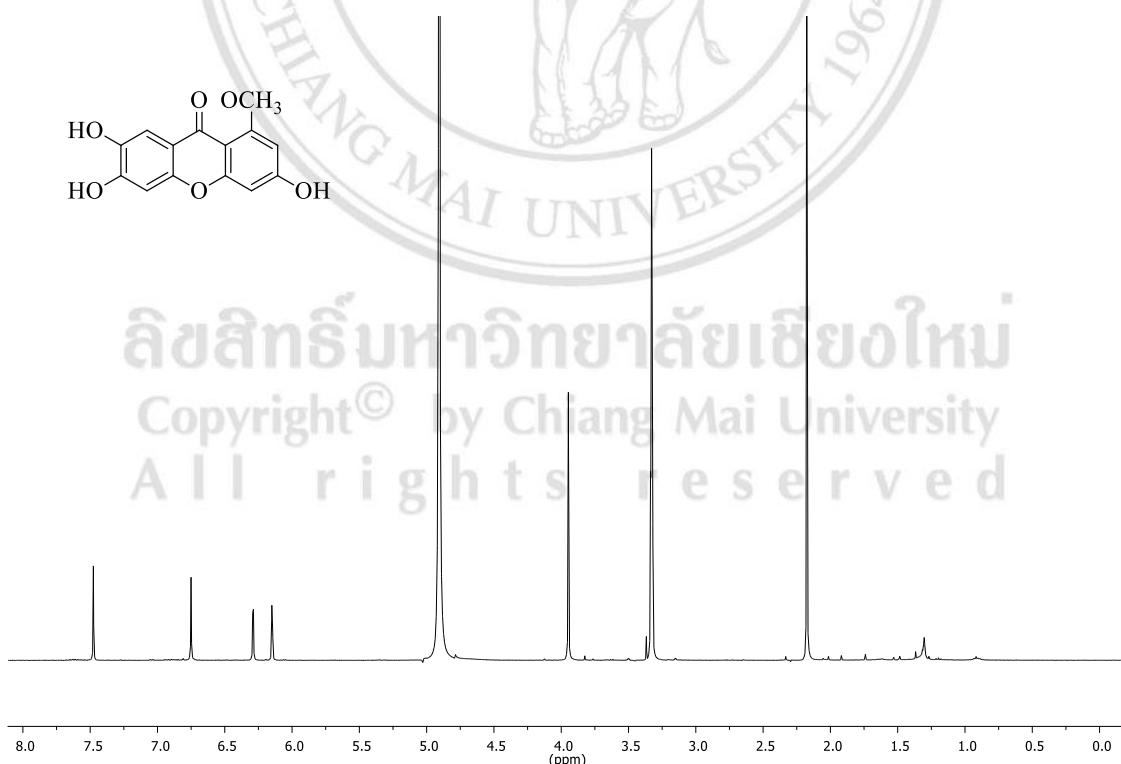
**Figure 60**  $^1\text{H}$  NMR (400 MHz, Acetone- $d_6$ ) Spectrum of **GMB8**



**Figure 61**  $^1\text{H}$  NMR (400 MHz, Acetone- $d_6$ ) Spectrum of **GMB9**



**Figure 62**  $^1\text{H}$  NMR (400 MHz,  $\text{CD}_3\text{OD}$ ) Spectrum of **GMB10**



**Figure 63**  $^1\text{H}$  NMR (400 MHz,  $\text{CD}_3\text{OD}$ ) Spectrum of **GMB11**

## CURRICULUM VITAE

Author's name	Mr. Chiramet Auranwiwat
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Place of birth	Lamphun, Thailand 51130
Education	2013 Bachelor of Science (2 <sup>nd</sup> class honor, Chemistry) Chiang Mai University
Scholarship	Human Resource Development in science Project (Science Achievement Scholarship of Thailand, SAST) Graduate School, Chiang Mai University
Publications	Auranwiwat C., Laphookhieo S., Trisuwan K., Pyne S. G., Ritthiwigrom T. 2014. Carbazole alkaloids and coumarins from the roots of <i>Clausena guillauminii</i> . <i>Phytochemistry Letters</i> 9, 113-116.  Auranwiwat, C., Trisuwan, K., Saiai, A., Pyne, S. G., Ritthiwigrom, T., 2014. Antibacterial tetraoxxygenated xanthones from immature fruits of <i>Garcinia cowa</i> . <i>Fitoterapia</i> 98, 179-183.

