APPENDIX A

A.1 Calculation of the percentage yield of the methanol and chloroform fraction of the methanol crude extracts

Table A.1 Calculation of the percentage yield of methanol and chloroform fraction of the methanol wood extract of *Hypericum hookerianum*

Dry wood powder (g)	(Experiment 1) 200		(Experiment 2) 300	
	No. 1	No. 2	No. 1	No. 2
Crude methanol extract (g)	11.5680	3.9913	15.3390	5.4413
(g) (% yield)	15.5593 (7.78%)		20.7803 (6.93%)	
Average % yield	7.36%			
Crude chloroform extract (g)	4.7355		5.3158	
(g) (% yield)	10.0513 (2.01%)			

Table A.2 Calculation of the percentage yield of methanol and chloroform fraction of the methanol leaf extract of *Garcinia speciosa*

Dry leaf powder (g)	(Experiment 1) 100		(Experiment 2) 200	
	No. 1	No. 2	No. 1	No. 2
Crude methanol extract (g)	5.9046	2.3423	12.0568	5.8727
(g) (% yield)	8.2469 (8.25%)		17.9295 (8.96%)	
Average % yield	8.61%			
Crude chloroform extract (g)	3.9422		9.0606	
(g) (% yield)	13.0028 (4.33%)			

Table A.3 Calculation of the percentage yield of methanol and chloroform fraction of the methanol wood extract of *Garcinia speciosa*

Dry wood powder (g)	(Experiment 1) 100		(Experiment 2) 100	
	No. 1	No. 2	No. 1	No. 2
Crude methanol extract (g)	8.8274	5.6243	7.0620	2.8502
(g) (% yield)	14.4517 (14.45%)		9.9122 (9.91%)	
Average % yield	12.18%			
Crude chloroform extract (g)	0.7567		0.5640	
(g) (% yield)	1.3207 (0.66%)			

Table A.4 Calculation of the percentage yield of methanol and chloroform fraction of the methanol leaf and wood extract of *Garcinia xanthochymus*

Dry leaf powder (g)	(Experiment 1) 200		(Experiment 2) 300	
	No. 1	No. 2	No. 1	No. 2
Crude methanol extract (g)	16.7026	7.6135	28.3829	9.8476
(g) (% yield)	24.3161 (12.16%)		38.2305 (12.74%)	
Average % yield	12.45%			
Crude chloroform extract (g)	2.7767		5.5861	
(g) (% yield)	8.3628 (1.67%)			
Dry wood powder (g)	(Experiment 1) 100		(Experiment 2) 100	
	No. 1	No. 2	No. 1	No. 2
Crude methanol extract (g)	12.9316	5.8105	14.1693	6.0717
(g) (% yield)	17.8421 (17.84%)		20.2410 (20.24%)	
Average % yield	19.04%			
Crude chloroform extract (g)	1.0105		1.0324	
(g) (% yield)	2.0429 (1.02%)			

Table A.5 Calculation of the percentage yield of methanol and chloroform fraction of the methanol fruit extract of *Garcinia xanthochymus*

Dry fruit powder (g)	(Experiment 1) 120		(2) -	
	No. 1	No. 2	No. 1	No. 2
Crude methanol extract (g)	18.7242	9.6040	-	-
(g) (% yield)	28.3282 (23.60%)		-	
Average % yield	23.60%			
Crude chloroform extract (g)	11.6291		-	
(g) (% yield)	11.6291 (9.69%)			

Table A.6 Calculation of the percentage yield of methanol and chloroform fraction of the methanol leaf and wood extract of *Cratoxylum formosum* ssp. *pruniflorum*

Dry leaf powder (g)	(Experiment 1) 200		(Experiment 2) 300	
	No. 1	No. 2	No. 1	No. 2
Crude methanol extract (g)	17.8107	7.6136	33.9633	15.1382
(g) (% yield)	25.4443 (12.72%)		49.4115 (16.36%)	
Average % yield	14.60%			
Crude chloroform extract (g)	7.4859		15.0293	
(g) (% yield)	22.5152 (4.50%)			
Dry wood powder (g)	(Experiment 1) 100		(Experiment 2) 100	
	No. 1	No. 2	No. 1	No. 2
Crude methanol extract (g)	2.7468	1.2432	7.0620	2.8502
(g) (% yield)	3.9900 (4.00%)		3.5334 (3.53%)	
Average % yield	3.77%			
Crude chloroform extract (g)	1.0751		0.9449	
(g) (% yield)	2.0200 (1.01%)			

Table A.7 Calculation of the percentage yield of methanol and chloroform fraction of the methanol leaf and wood extract of *Calophyllum polyanthum*

Dry leaf powder (g)	(Experiment 1) 100		(Experiment 2) 200	
	No. 1	No. 2	No. 1	No. 2
Crude methanol extract (g)	8.3825	3.7261	13.9975	6.1916
(g) (% yield)	12.1086 (12.11%)		20.1891 (10.09%)	
Average % yield	11.10%			
Crude chloroform extract (g)	8.7320		16.7714	
(g) (% yield)	25.5034 (8.50%)			
Dry wood powder (g)	(Experiment 1) 100		(Experiment 2) 100	
	No. 1	No. 2	No. 1	No. 2
Crude methanol extract (g)	3.0102	1.1448	3.4372	1.3203
(g) (% yield)	4.1550 (4.16%)		4.7575 (4.76%)	
Average % yield	4.46%			
Crude chloroform extract (g)	2.5396		2.7604	
(g) (% yield)	5.3000 (2.65%)			

A.2 Calculation of 50% free radical scavenging activity (IC_{50}) of the methanol and chloroform fraction of the methanol crude extracts

IC_{50} is the concentration in the test system giving 50% scavenging activity

$$\text{Scavenging activity} = a * (\text{sample concentration}) + b$$

$$a = \frac{\text{scavenging activity of conc(2) - scavenging activity of (conc1)}}{\text{conc(2) - conc(1)}}$$

$$b = \text{scavenging activity of conc(1)} - a * \text{conc(1)}$$

conc (1): highest sample concentration giving **less** than 50% activity of control

conc (2): lowest sample concentration giving **more** than 50% activity of control

$$IC_{50} = \frac{50 - b}{a}$$

Table A.8 DPPH radical scavenging activity (%) of the extracts

Plant /concentration (μg/ml)	Radical scavenging activity (%)					
	Wood		Leaf		Fruit	
	MeOH	$CHCl_3$	MeOH	$CHCl_3$	MeOH	$CHCl_3$
H. hookerianum						
2000	96.63± 0.79	92.95± 1.82	-	-	-	-
1000	96.63± 0.79	91.70± 3.35				
500	96.35± 0.41	90.33± 2.78				
250	95.68± 0.25	85.71± 0.93				
100	94.21± 1.61	70.40± 1.11				
50	94.31± 2.56	40.90± 5.90				
25	92.92± 1.95	19.87± 8.80				
12.5	2.27± 0.96	-				
6.25	0.61± 1.06	-				
IC_{50}	19.08	65.42				
G. speciosa						
2000	97.81± 0.88	92.54± 1.82	93.95± 0.90	93.36± 0.22	-	-
1000	95.34± 0.31	92.75± 2.41	92.39± 0.50	91.11± 1.34		
500	95.37± 0.78	92.86± 1.28	90.82± 0.33	91.88± 2.75		
250	94.47± 0.95	92.70± 1.53	89.06± 0.27	92.41± 1.30		
100	94.62± 0.89	54.83± 2.09	72.06± 1.42	78.57± 2.12		
50	94.35± 1.20	31.70± 2.07	40.43± 0.89	43.01± 0.77		
25	70.10± 3.76	17.22± 2.44	25.97± 1.16	22.70± 0.87		
12.5	67.38± 6.65	-	-	-		
6.25	27.91± 3.97	-	-	-		
IC_{50}	9.75	142.00	65.13	168.00		
G. xanthochymus						
2000	95.47± 1.16	96.40± 1.41	93.23± 1.80	91.97± 1.70	91.82± 0.76	95.39± 2.05
1000	94.59± 0.74	95.00± 1.42	91.68± 1.61	89.66± 3.15	90.57± 1.32	94.27± 2.00
500	93.99± 1.78	94.52± 2.09	90.32± 0.76	87.22± 3.91	87.56± 2.06	93.49± 2.66
250	93.42± 2.05	93.22± 2.49	88.77± 1.29	69.46± 4.57	74.20± 1.03	91.61± 1.64
100	87.69± 3.67	53.98± 4.03	62.03± 1.83	36.22± 5.27	64.77± 1.18	89.27± 3.09
50	73.01± 1.98	31.78± 2.98	47.47± 1.51	20.57± 1.53	49.65± 1.48	77.95± 1.98
25	40.87± 0.63	19.30± 2.08	10.07± 0.75	14.09± 1.85	35.23± 2.85	47.99± 1.91
IC_{50}	32.10	89.56	58.69	59.83	25.58	26.68

Value are expressed as mean ± SD of the three independent measurement

Table A.8 DPPH radical scavenging activity (%) of the extracts (continued)

Plant /concentration	Radical scavenging activity (%)					
	Wood		Leaf		Fruit	
(μg/ml)	MeOH	$CHCl_3$	MeOH	$CHCl_3$	MeOH	$CHCl_3$
C. formosum						
2000	96.07± 1.07	96.90± 2.22	94.54± 1.29	93.81± 0.60	-	-
1000	90.99± 1.32	94.51± 1.58	92.95± 1.01	92.79± 1.15		
500	89.61± 2.18	79.22± 0.67	91.54± 1.33	93.09± 0.93		
250	88.70± 0.99	51.35± 2.41	91.01± 1.33	92.07± 1.73		
100	86.17± 1.28	25.32± 1.90	52.23± 2.55	75.48± 0.29		
50	85.01± 0.23	14.38± 2.10	35.63± 0.38	33.83± 5.75		
25	54.20± 1.37	9.03± 1.78	17.12± 1.03	22.46± 0.76		
12.5	3.48± 0.97	-	-	-		
6.25	3.08± 1.21	-	-	-		
IC_{50}	23.96	91.04	93.28	162.34		
C. polyanthum						
2000	97.07± 0.20	98.52± 1.03	94.69± 1.35	94.89± 1.45	-	-
1000	95.02± 1.03	96.15± 1.31	91.86± 1.77	94.62± 1.34		
500	93.57± 2.32	95.03± 1.07	91.86± 1.77	93.27± 1.79		
250	93.05± 2.02	84.64± 3.28	90.44± 2.21	70.55± 3.87		
100	87.24± 2.64	42.29± 3.91	67.92± 1.86	35.39± 1.77		
50	58.64± 2.24	24.16± 0.70	49.30± 2.15	20.34±2.50		
25	20.78± 2.45	17.03± 0.62	8.51± 0.45	14.48± 2.0		
IC_{50}	44.29	242.25	51.88	69.41		
S. verruculosa						
2000	97.07± 1.84	93.95± 1.82	96.94± 1.76	95.02± 1.94	-	-
1000	94.10± 3.22	93.34± 2.44	92.01± 2.57	92.65± 1.64		
500	93.65± 3.25	93.51± 2.18	89.33± 2.74	91.72± 3.73		
250	93.81± 2.50	80.67± 5.18	74.59± 1.06	68.19± 3.94		
100	93.02± 4.50	38.07± 1.96	42.41± 2.11	34.97± 1.73		
50	92.10± 4.59	16.41± 3.36	11.10± 2.50	21.42± 0.28		
25	55.07± 3.36	5.55± 2.16	2.89± 0.25	11.32± 1.64		
12.5	16.78± 3.51	-	-	-		
6.25	9.33± 1.14	-	-	-		
IC_{50}	23.34	127.34	130.00	162.18		

Value are expressed as mean ± SD of the three independent measurement

APPENDIX B

B.1 Optimum cell density of HeLa, KB and B16F10 cell lines in SRB assay

Table B.1 Inoculation densities of cell lines

Cell density (cell/ml)	OD (492 nm)		
	HeLa	KB	B16F10
5,000	0.0428	0.2906	0.3463
10,000	0.0826	0.3445	0.3710
20,000	0.1723	0.2378	0.2103
50,000	-0.0477	-0.0053	-0.7652
Proper cell density	20,000	10,000	10,000

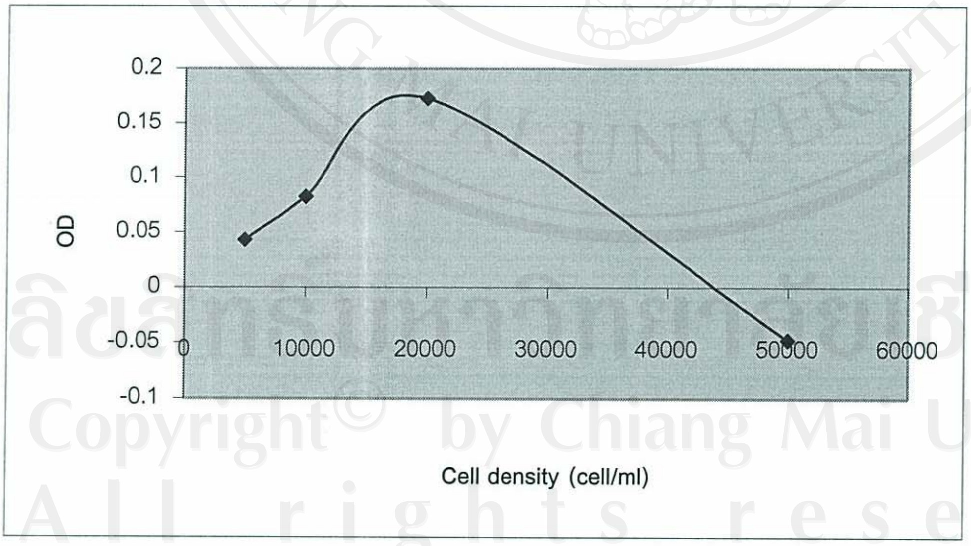

Figure B.1 Optimum cell density of HeLa cell line in SRB assay

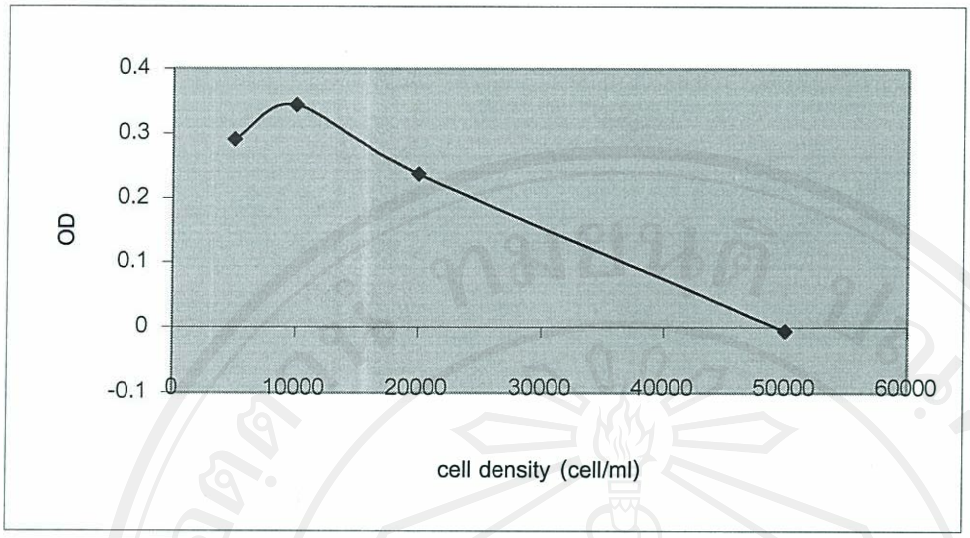

Figure B.2 Optimum cell density of KB cell line in SRB assay

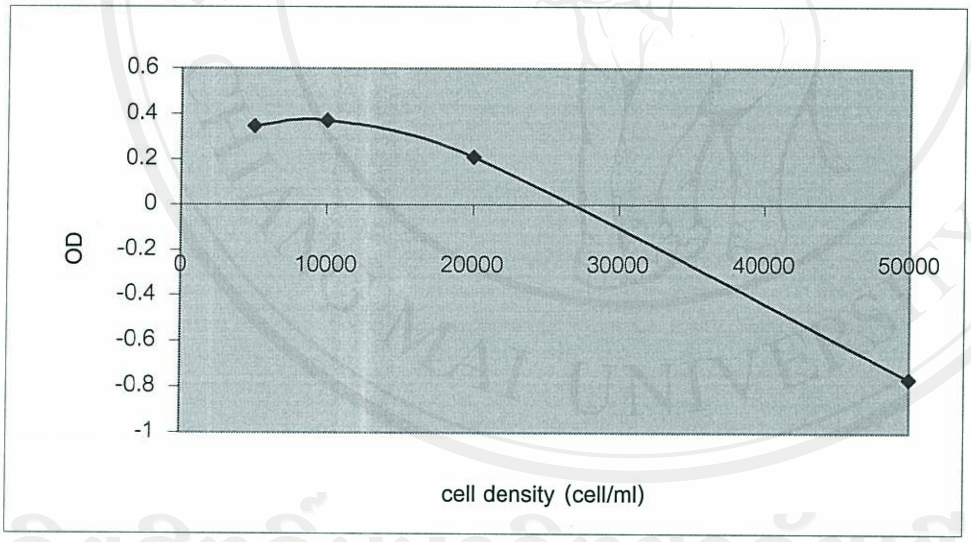

Figure B.3 Optimum cell density of B16F10 cell line in SRB assay

B.2 Calculation of the 50% growth inhibition (GI_{50}) of the crude extracts and positive control on cancer cell lines

1. From each concentration of compound can be calculated for % cell growth using the equation

% cell growth (%G) = [(T-To) / (C – To)] x 100

T = test optical density

C = control optical density

To = optical density at time zero (the time at which compounds are added)

2. Plot curve between concentration (X) and % G (Y)
3. From the dose response curve, the 50% growth inhibition (GI_{50}) was calculated using least-squares line. The equation is

Y= a + bX

b = slope

The unknown coefficients a and b can therefore be obtained:

$$\begin{cases} a = \dfrac{\left(\sum y\right)\left(\sum x^2\right) - \left(\sum x\right)\left(\sum xy\right)}{n\sum x^2 - \left(\sum x\right)^2} \\ b = \dfrac{n\sum xy - \left(\sum x\right)\left(\sum y\right)}{n\sum x^2 - \left(\sum x\right)^2} \end{cases}$$

4. Calculate average GI_{50} (µg/ml) ± SD

APPENDIX C

Spectrum of the isolated compounds

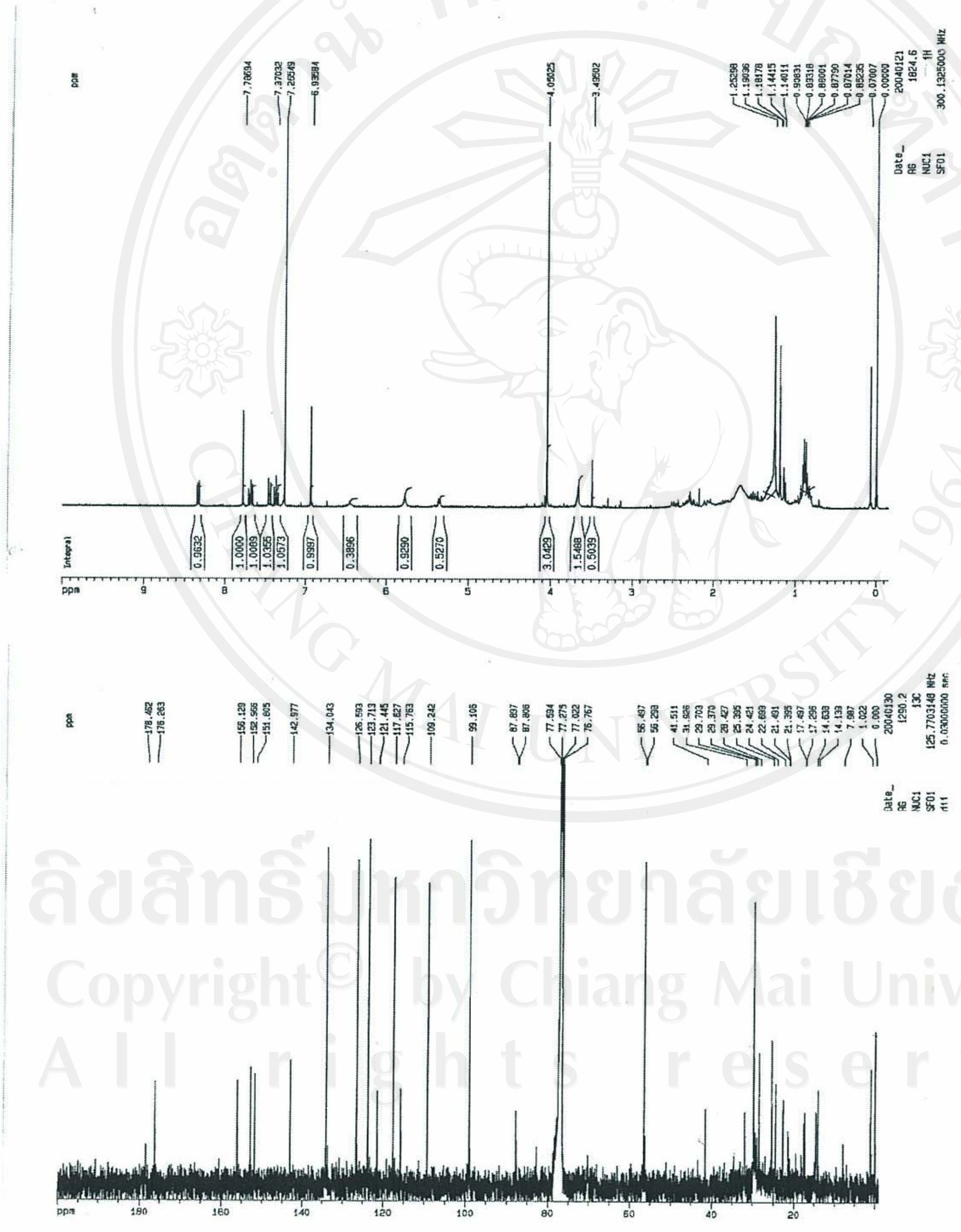

Figure C.1 ^{1}H-, ^{13}C-NMR analysis of 5-hydroxy-2-methoxyxanthone

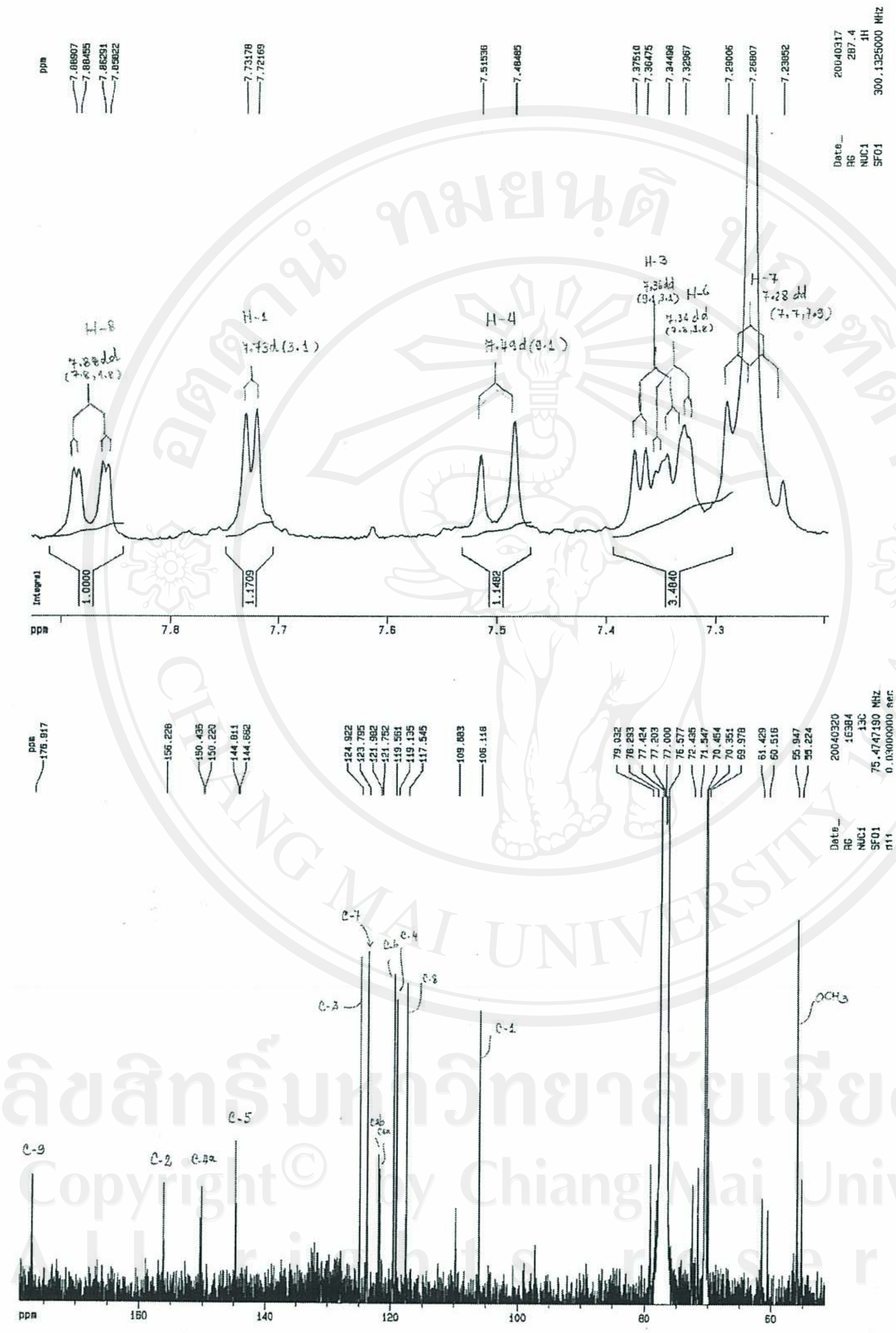

Figure C.2 ^{1}H-, ^{13}C-NMR analysis of 2-hydroxy-3-methoxyxanthone

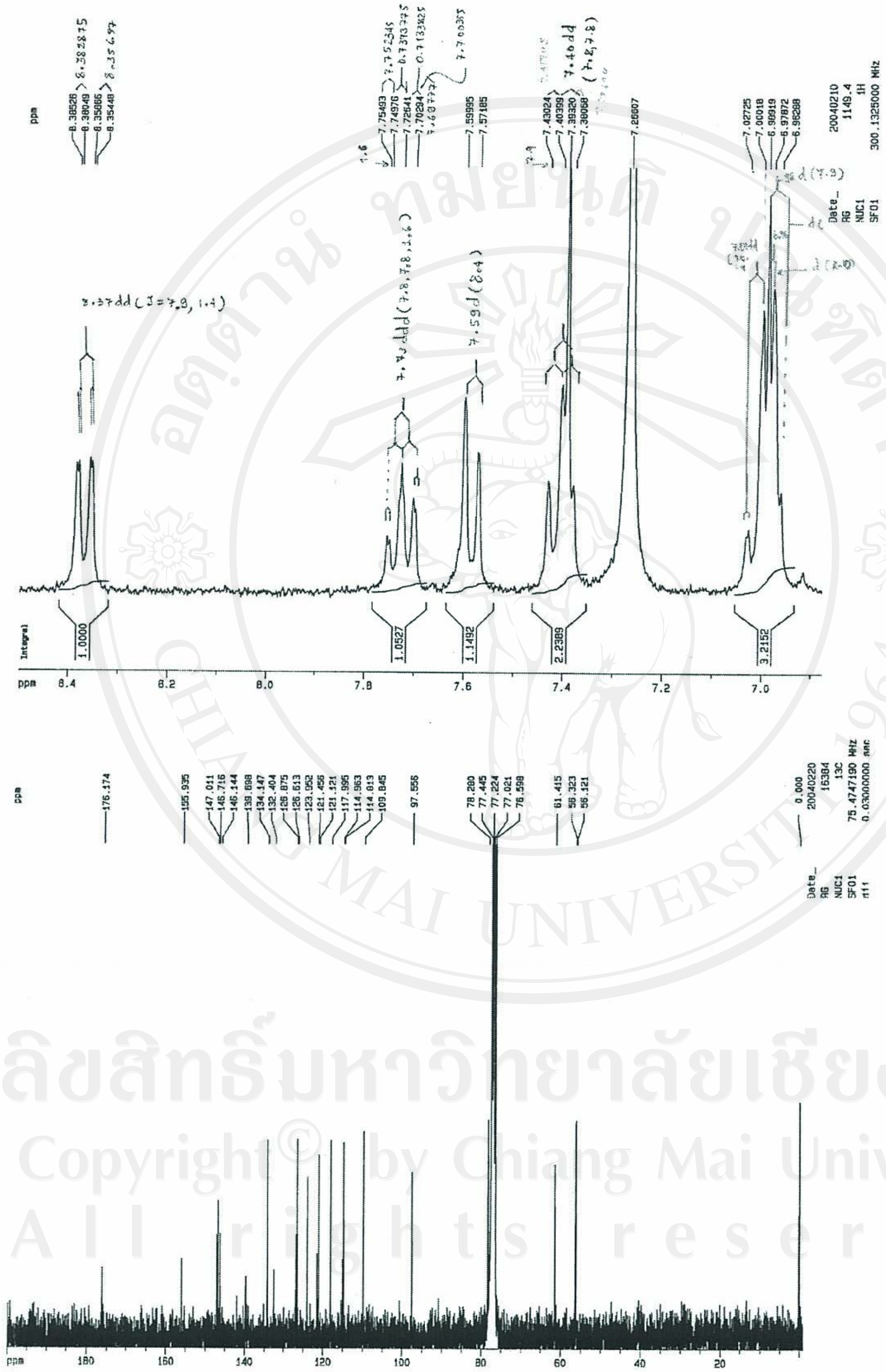

Figure C.3 ^{1}H-, ^{13}C-NMR analysis of *trans*-kielcorin

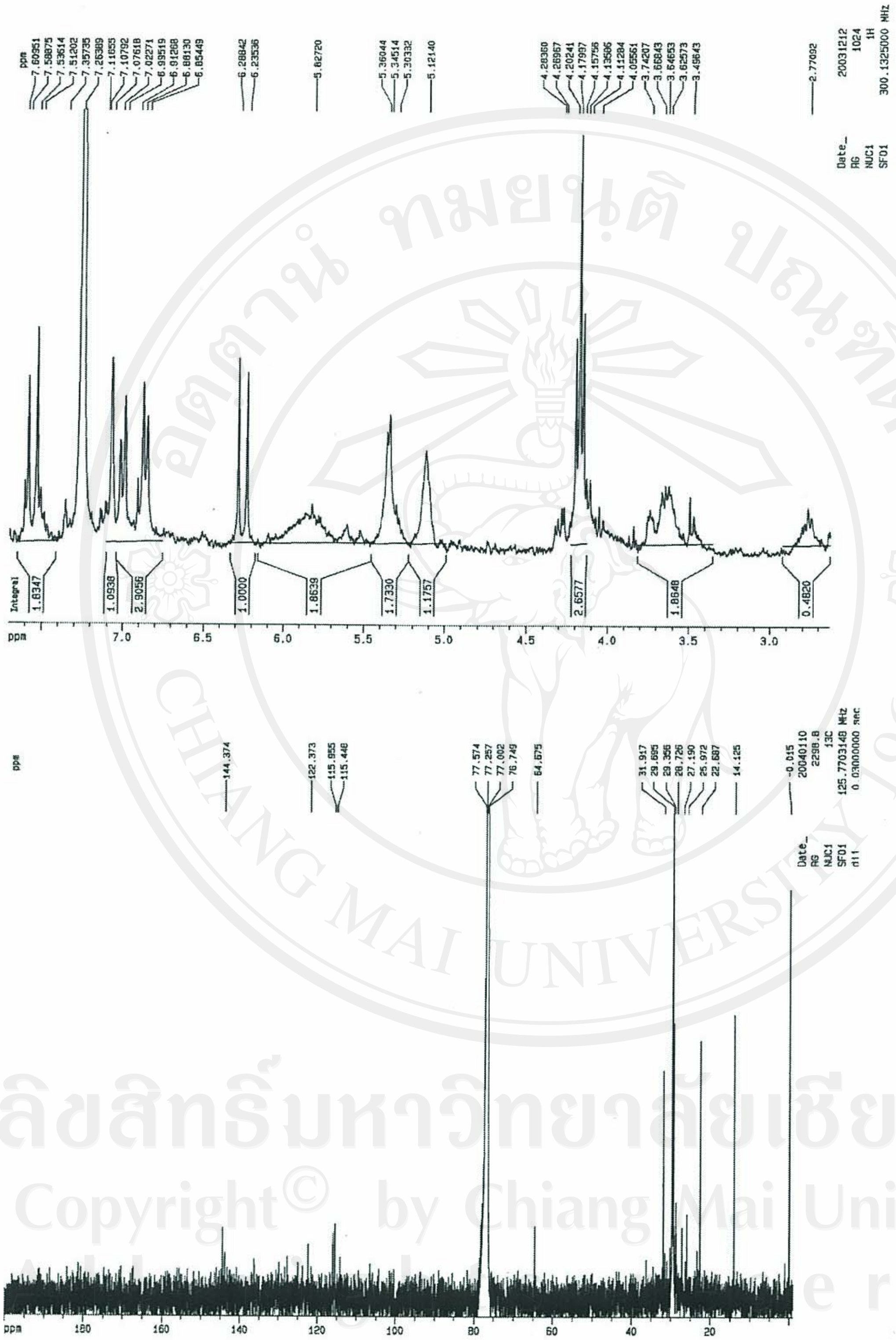

Figure C.4 ^{1}H-, ^{13}C-NMR analysis of 4-Hydroxy-3-methoxyphenyl ferulate

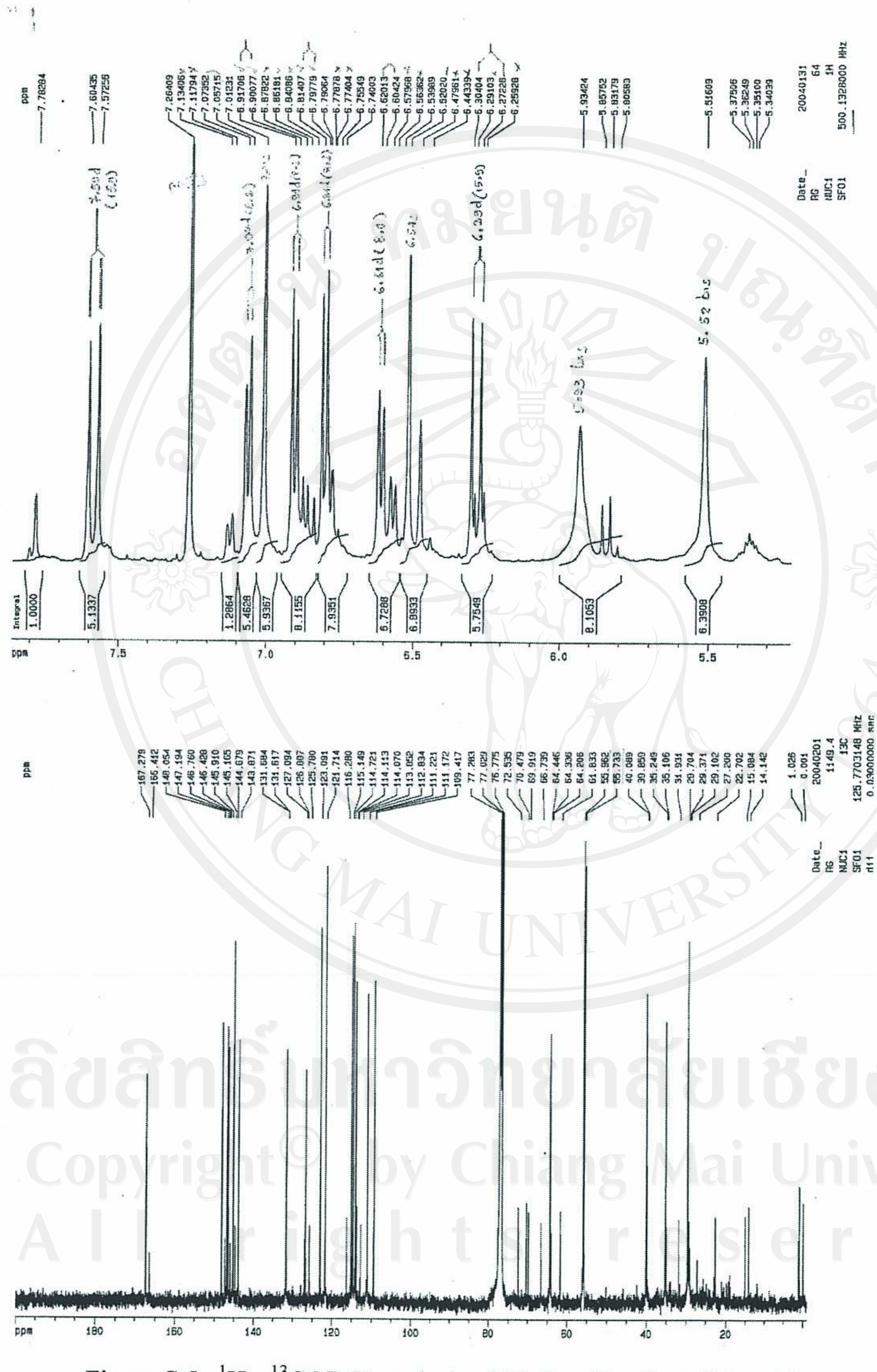

Figure C.5 ^{1}H-, ^{13}C-NMR analysis of 3β-O-caffeoylbetulinic acid

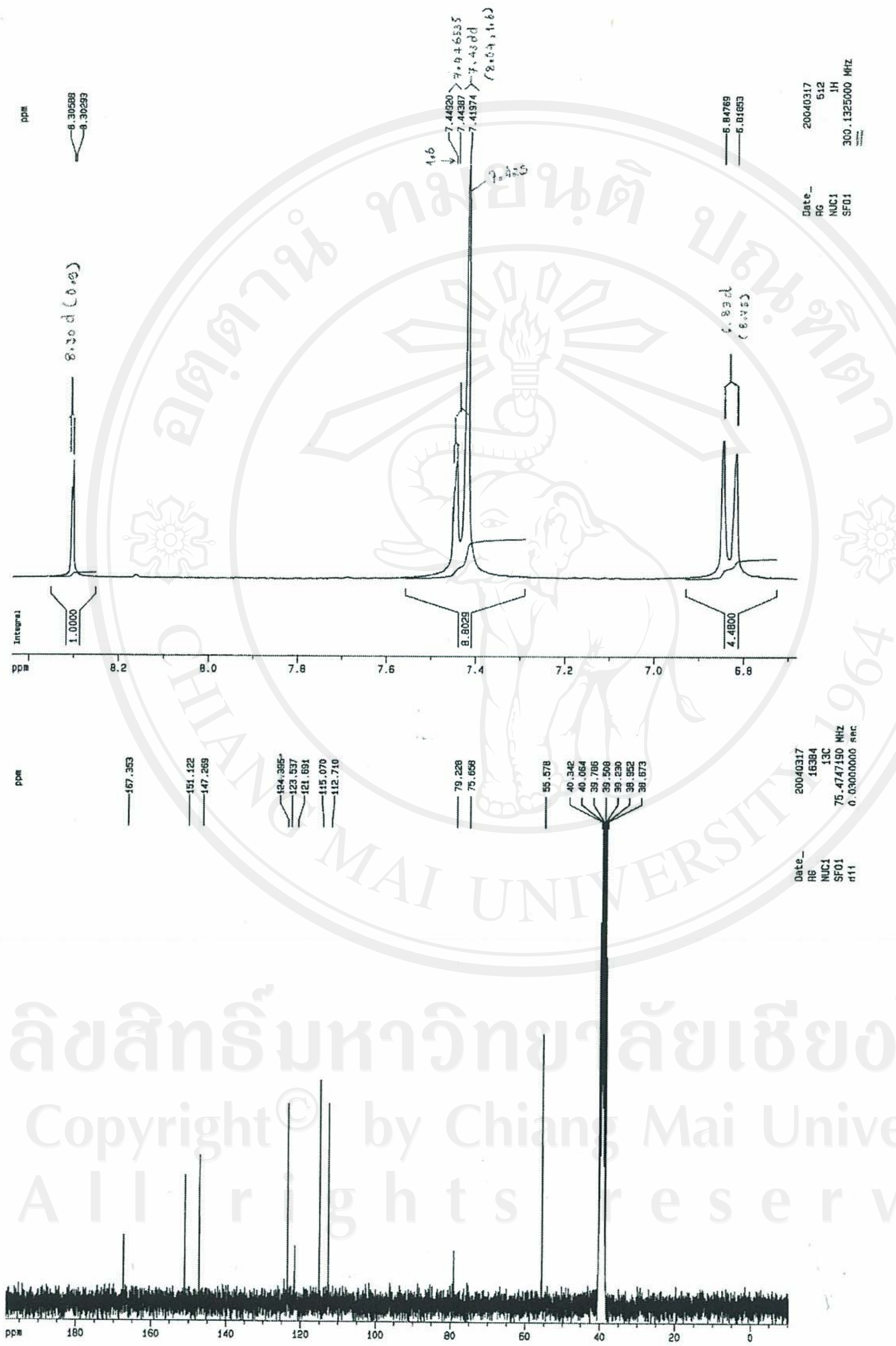

Figure C.6 ^{1}H-, ^{13}C-NMR analysis of vanillic acid

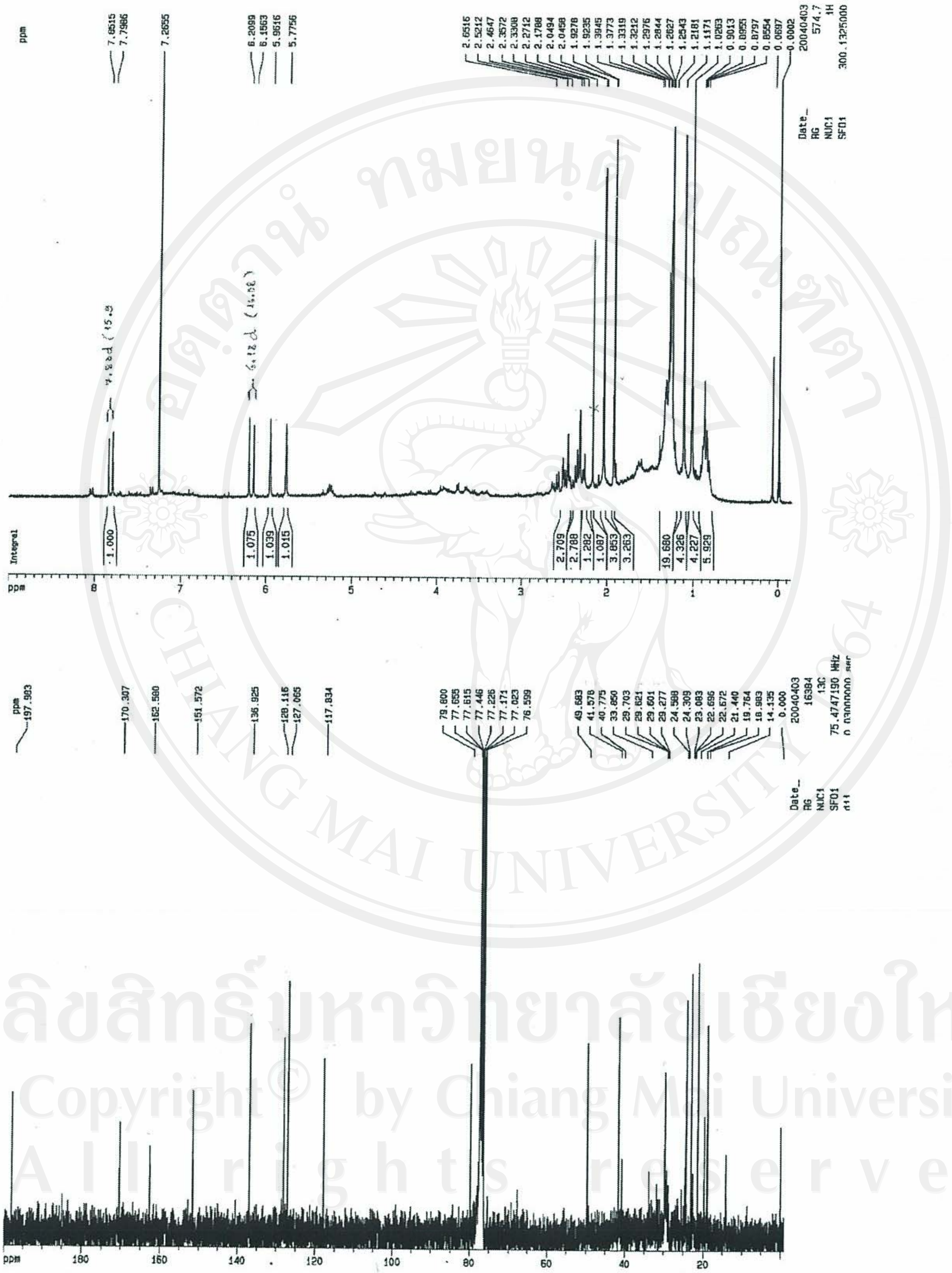

Figure C.7 ^{1}H-, ^{13}C-NMR analysis of abscisic acid

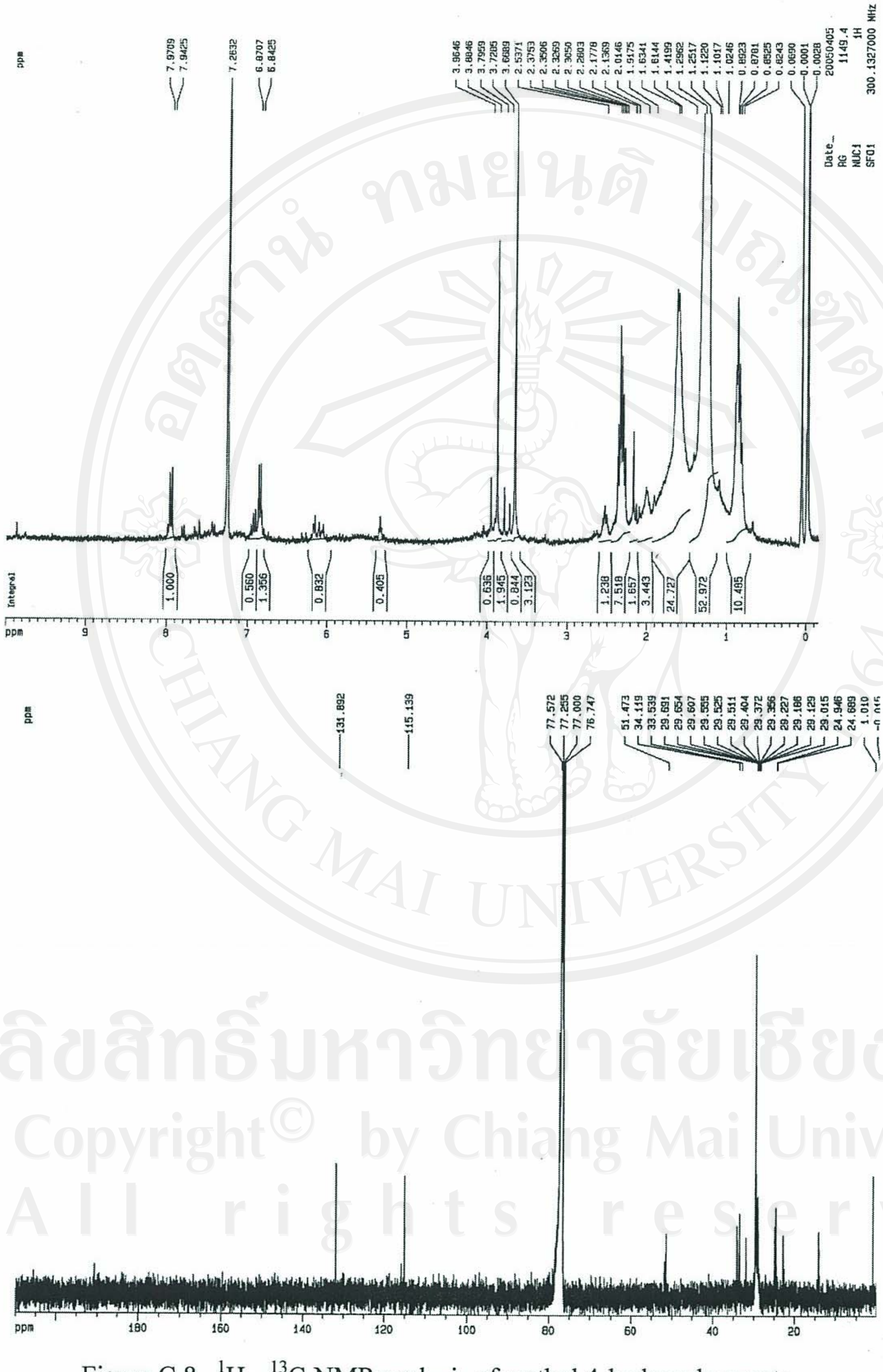

Figure C.8 ^{1}H-, ^{13}C-NMR analysis of methyl 4-hydroxybenzoate

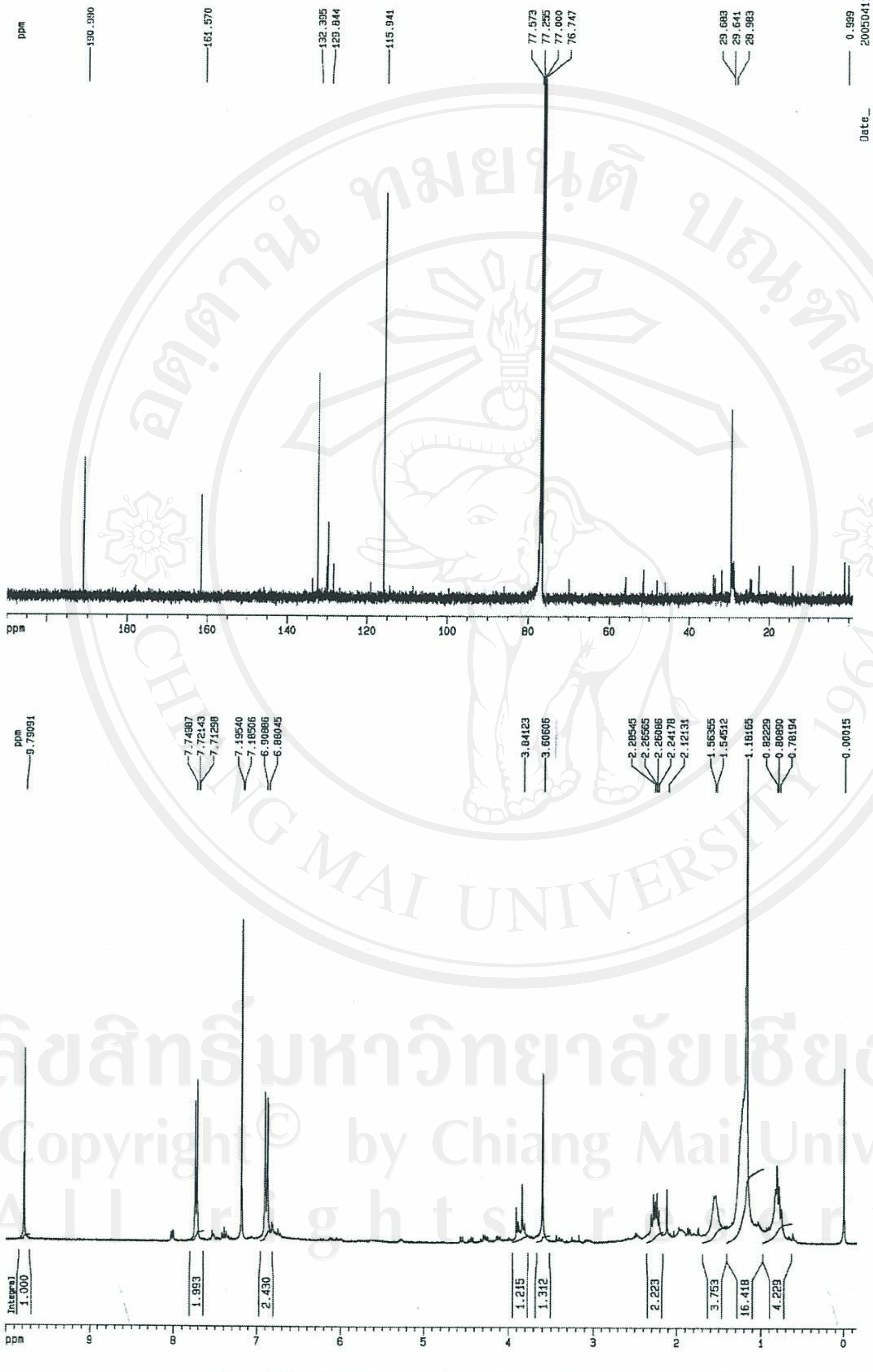

Figure C.9 ^{1}H-, ^{13}C-NMR analysis of 4-hydroxybenzaldehyde

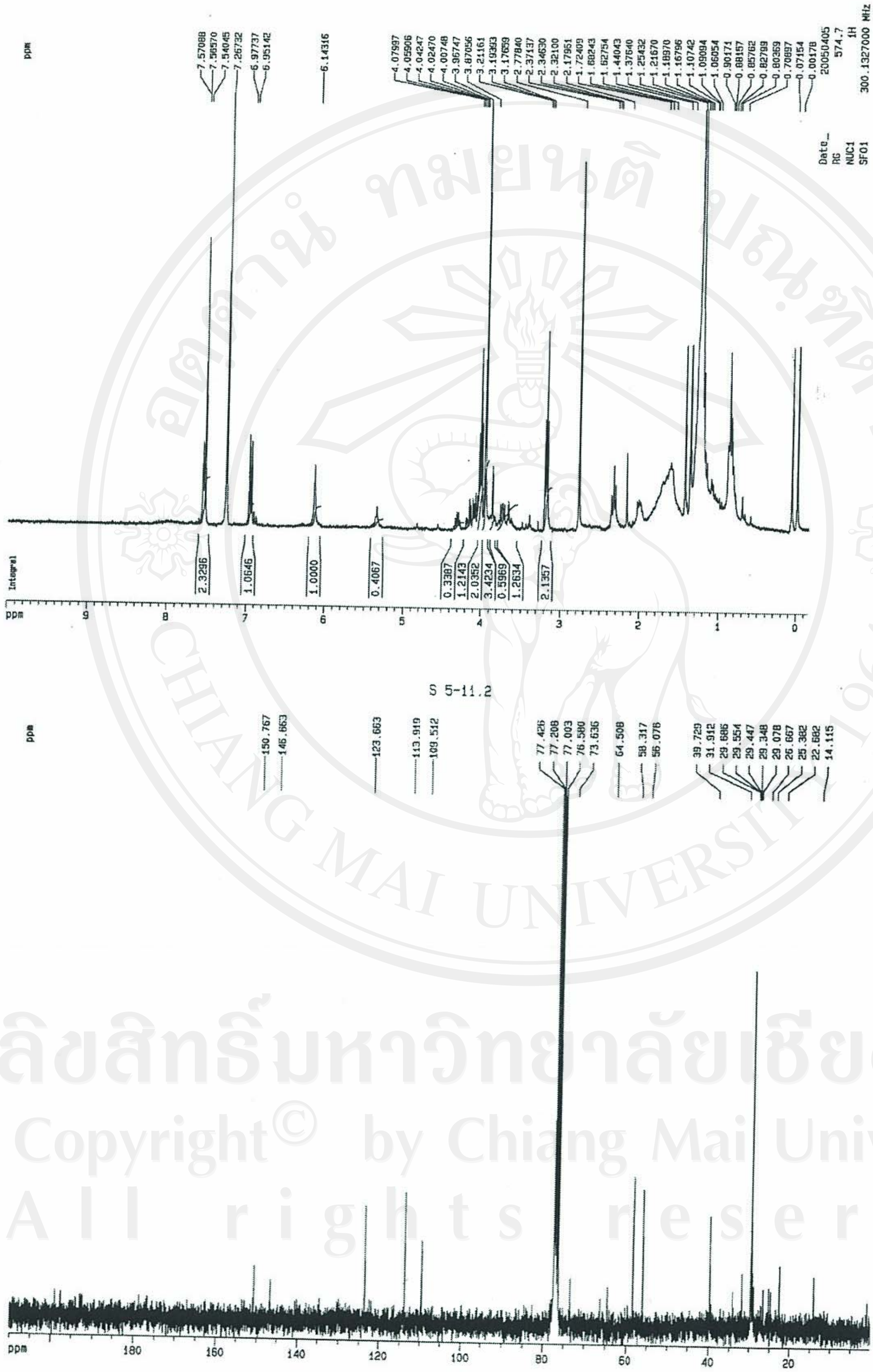

Figure C.10 ^{1}H-, ^{13}C-NMR analysis of methyl 3,4 dihydroxybenzoate

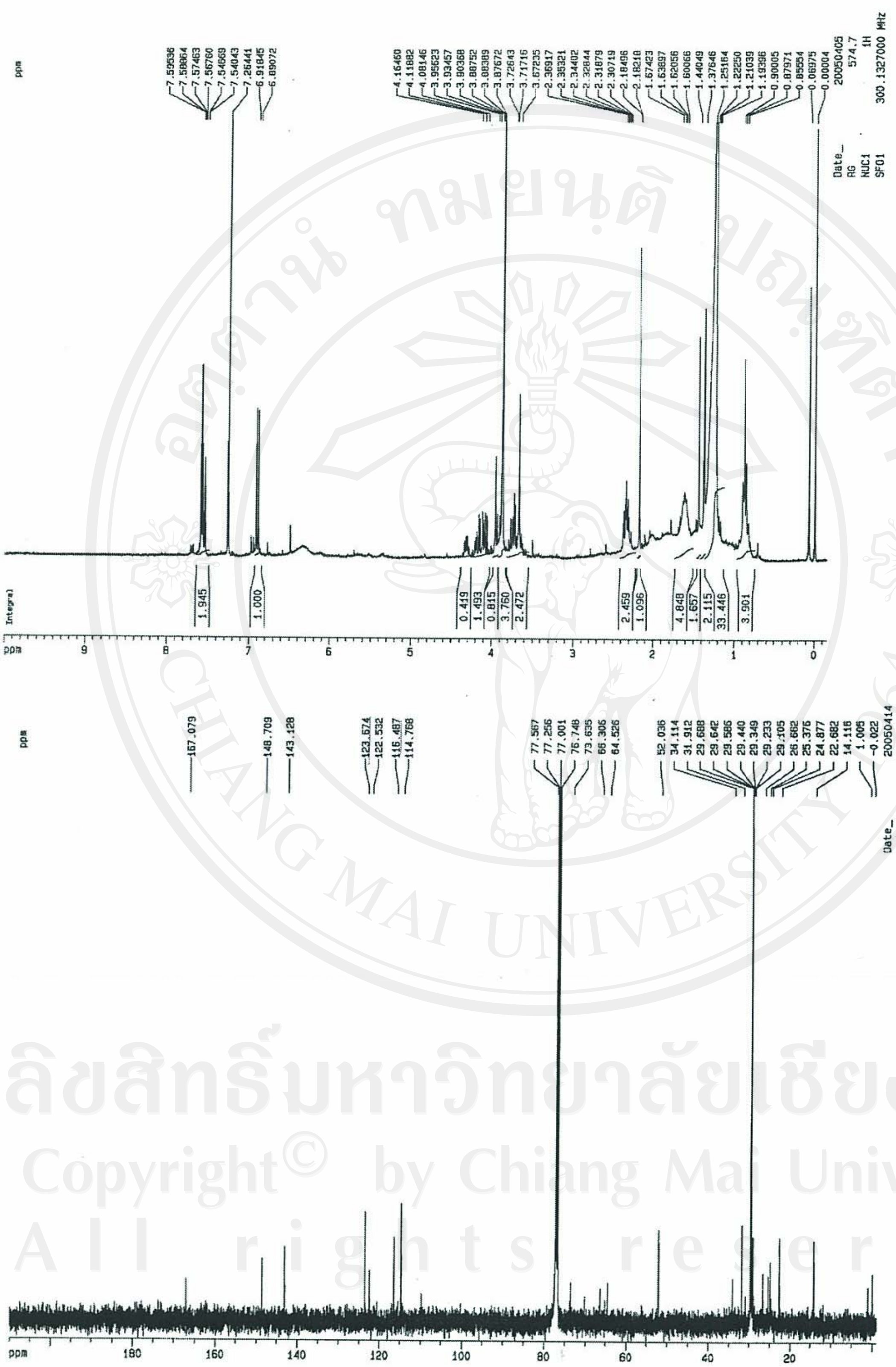

Figure C. 11 ^{1}H-, ^{13}C-NMR analysis of 1-(4-hydroxy-3-methoxyphenyl)-3-hydroxyl-propan-1-one

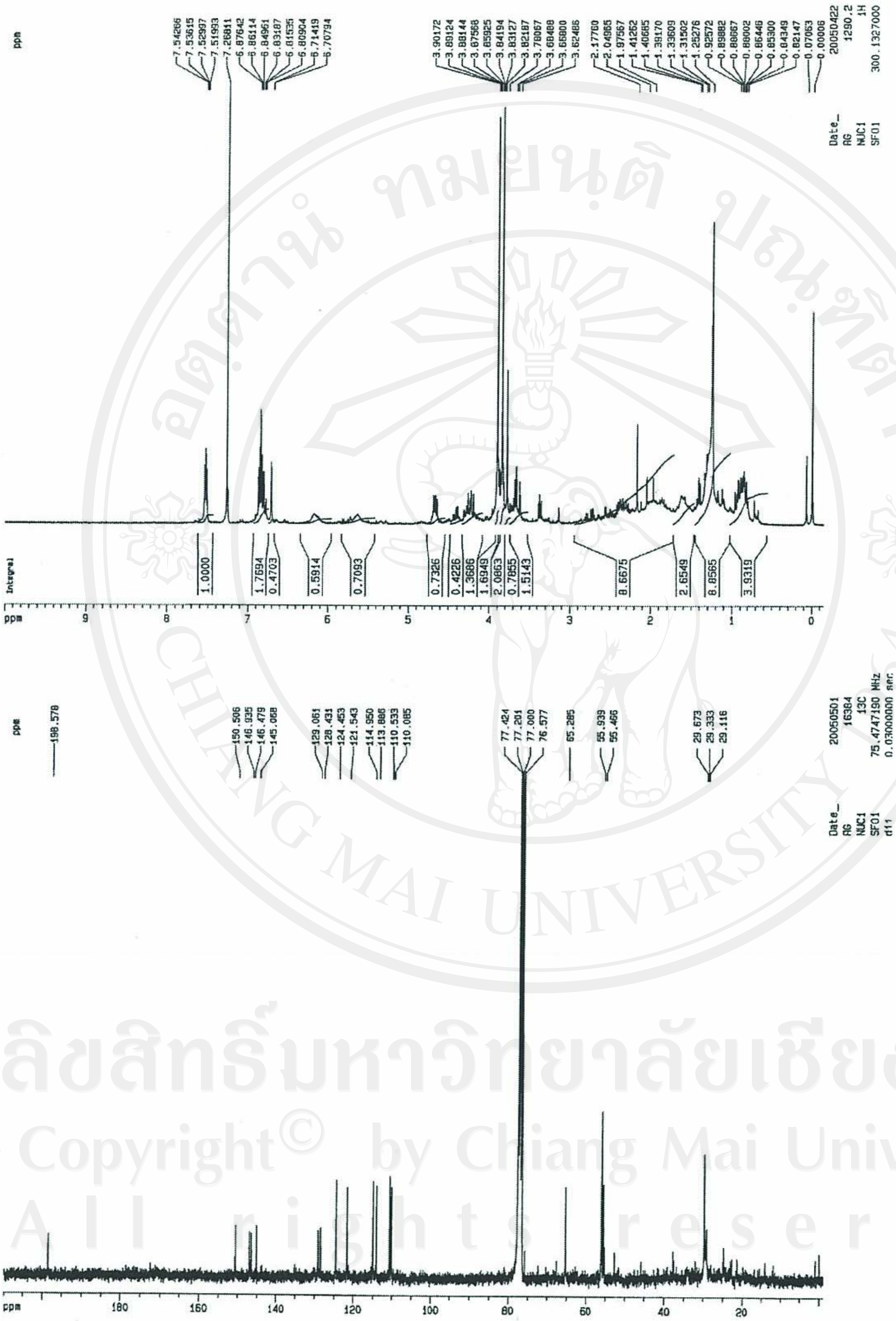

Figure C.12 ^{1}H-, ^{13}C-NMR analysis of 1,2-bis-(4-hydroxy-3-methoxyphenyl)-3-hydroxyl-propan-1-one

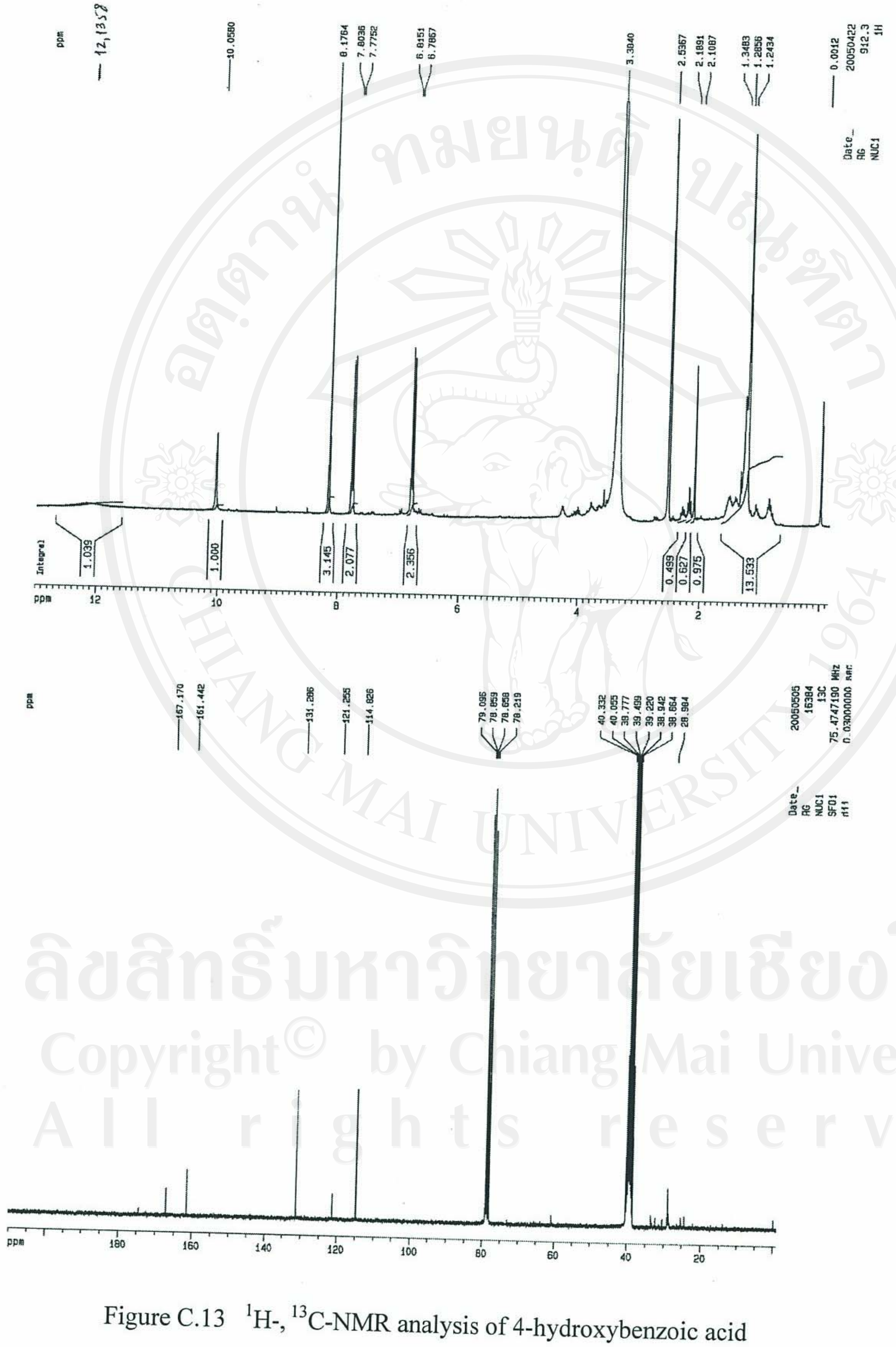

Figure C.13 ^{1}H-, ^{13}C-NMR analysis of 4-hydroxybenzoic acid

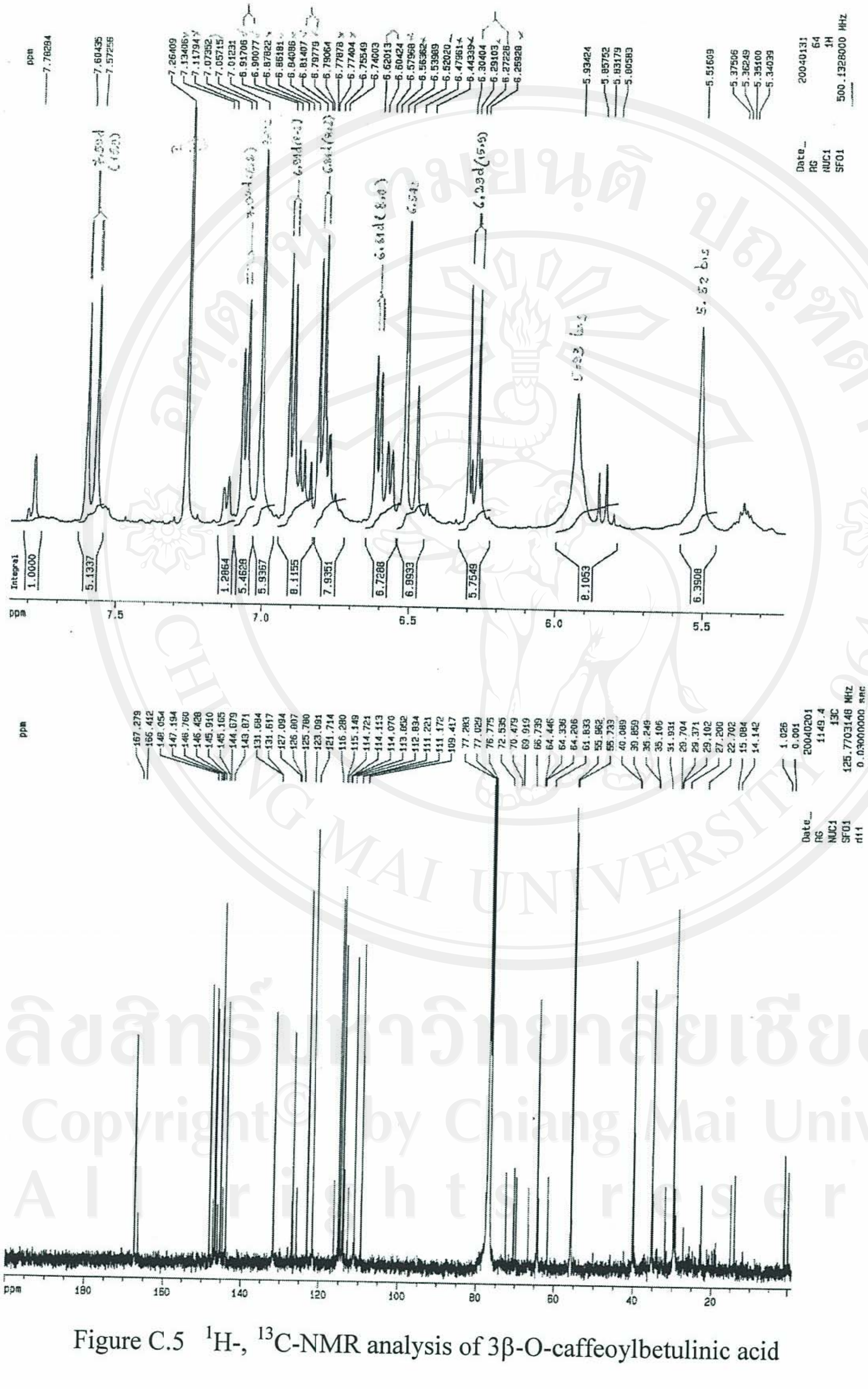

Figure C.5 ^{1}H-, ^{13}C-NMR analysis of 3β-O-caffeoylbetulinic acid

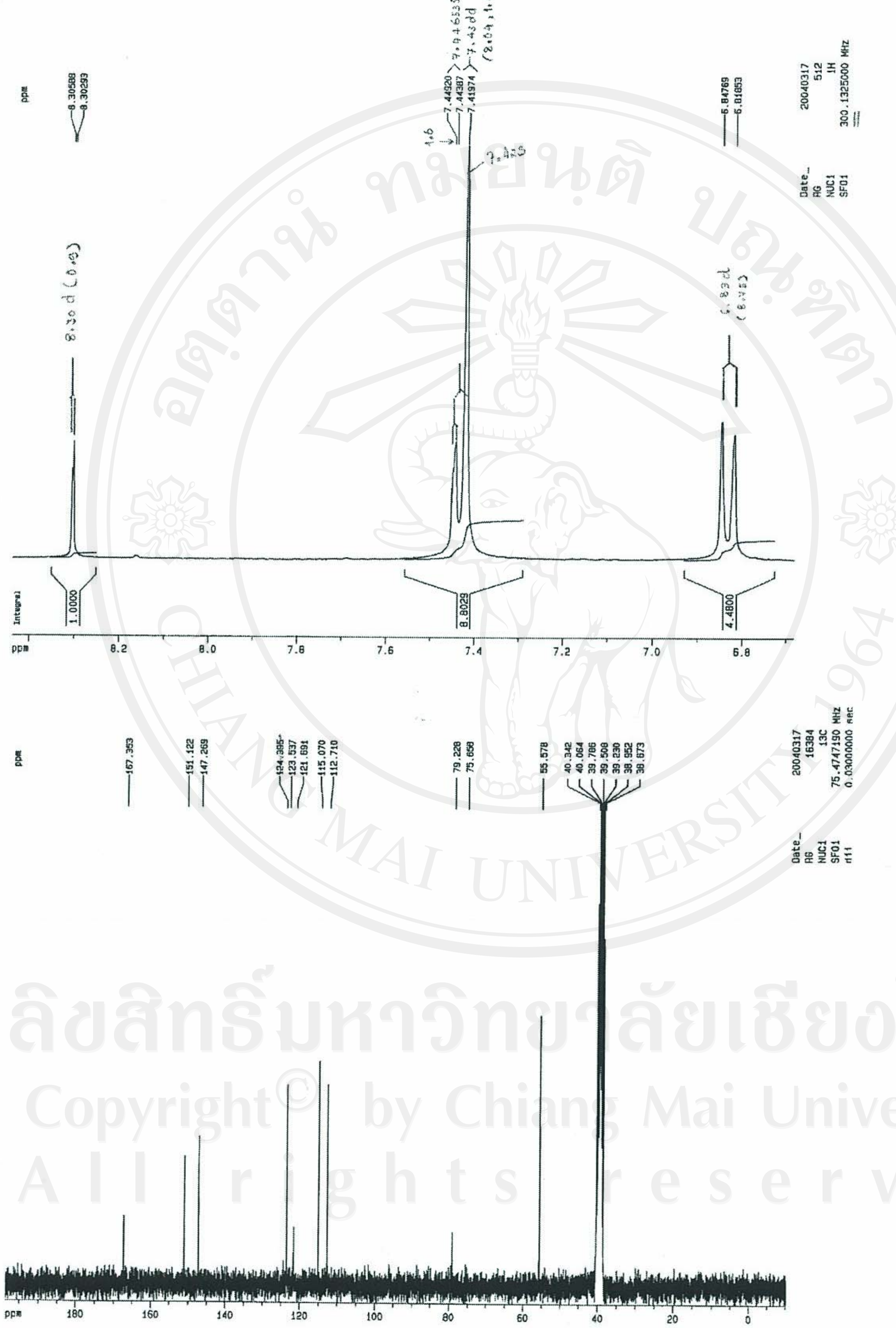

Figure C.6 ^{1}H-, ^{13}C-NMR analysis of vanillic acid

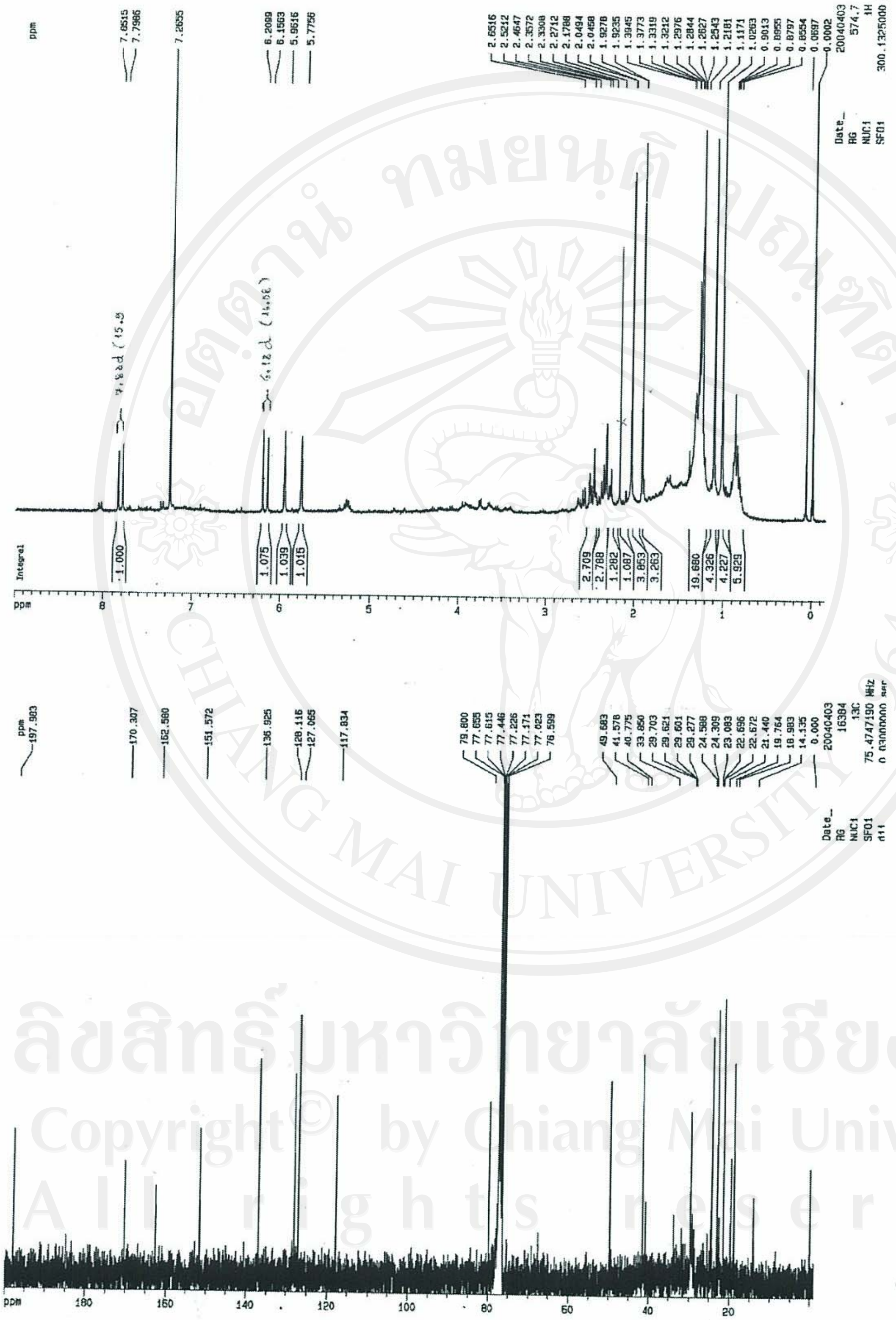

Figure C.7 ^{1}H-, ^{13}C-NMR analysis of abscisic acid

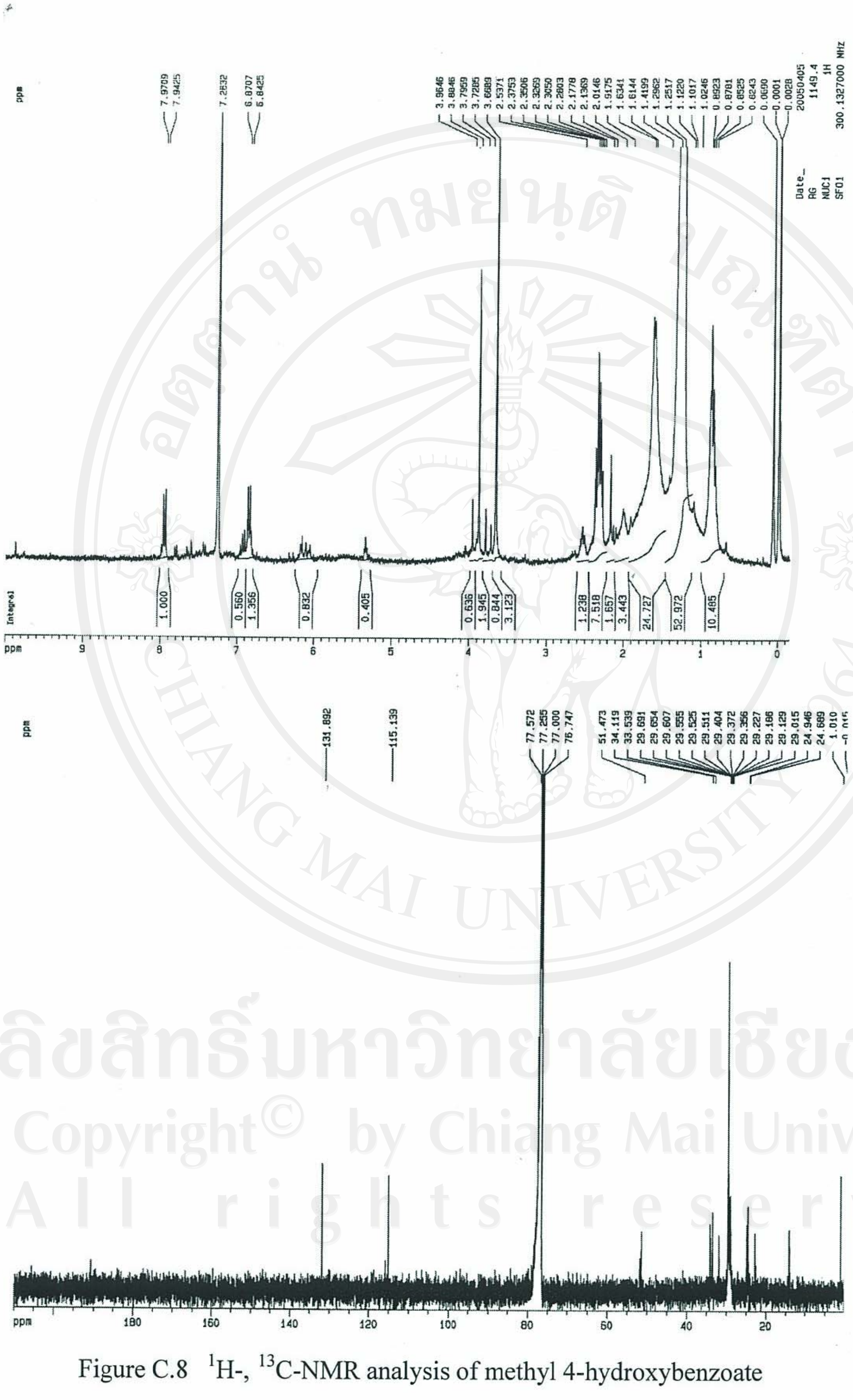

Figure C.8 ^{1}H-, ^{13}C-NMR analysis of methyl 4-hydroxybenzoate

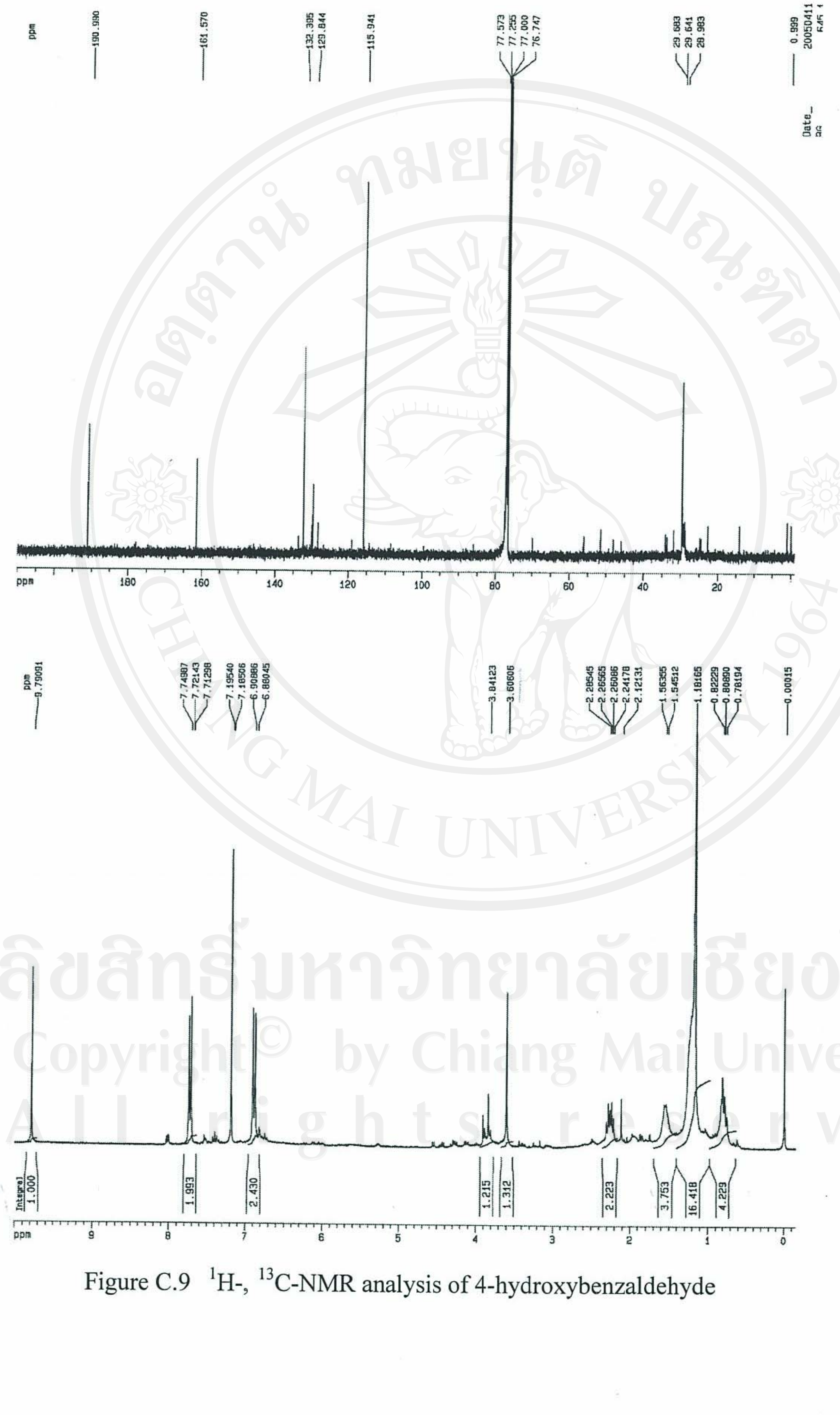

Figure C.9 ^{1}H-, ^{13}C-NMR analysis of 4-hydroxybenzaldehyde

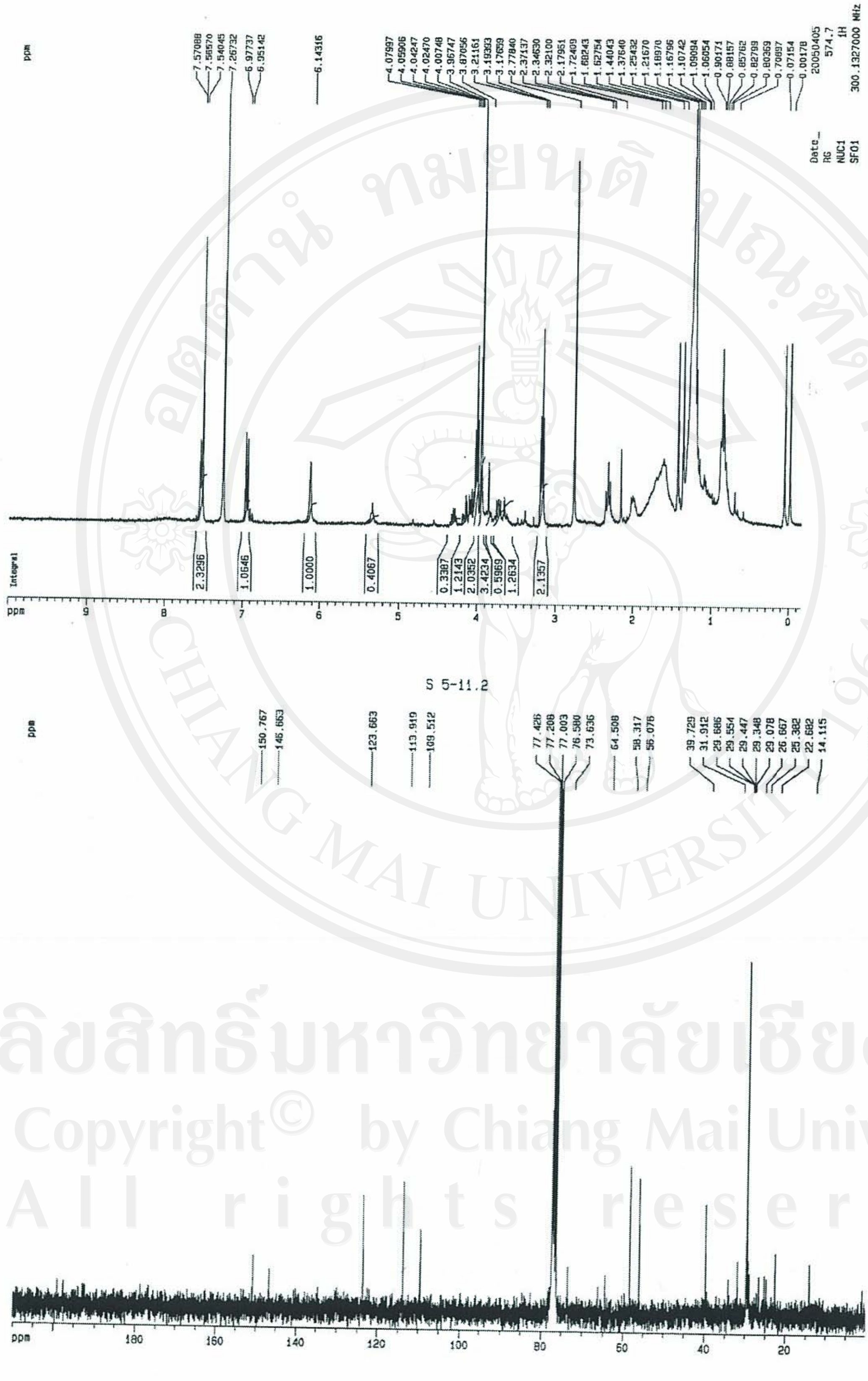

Figure C.10 ^{1}H-, ^{13}C-NMR analysis of methyl 3,4 dihydroxybenzoate

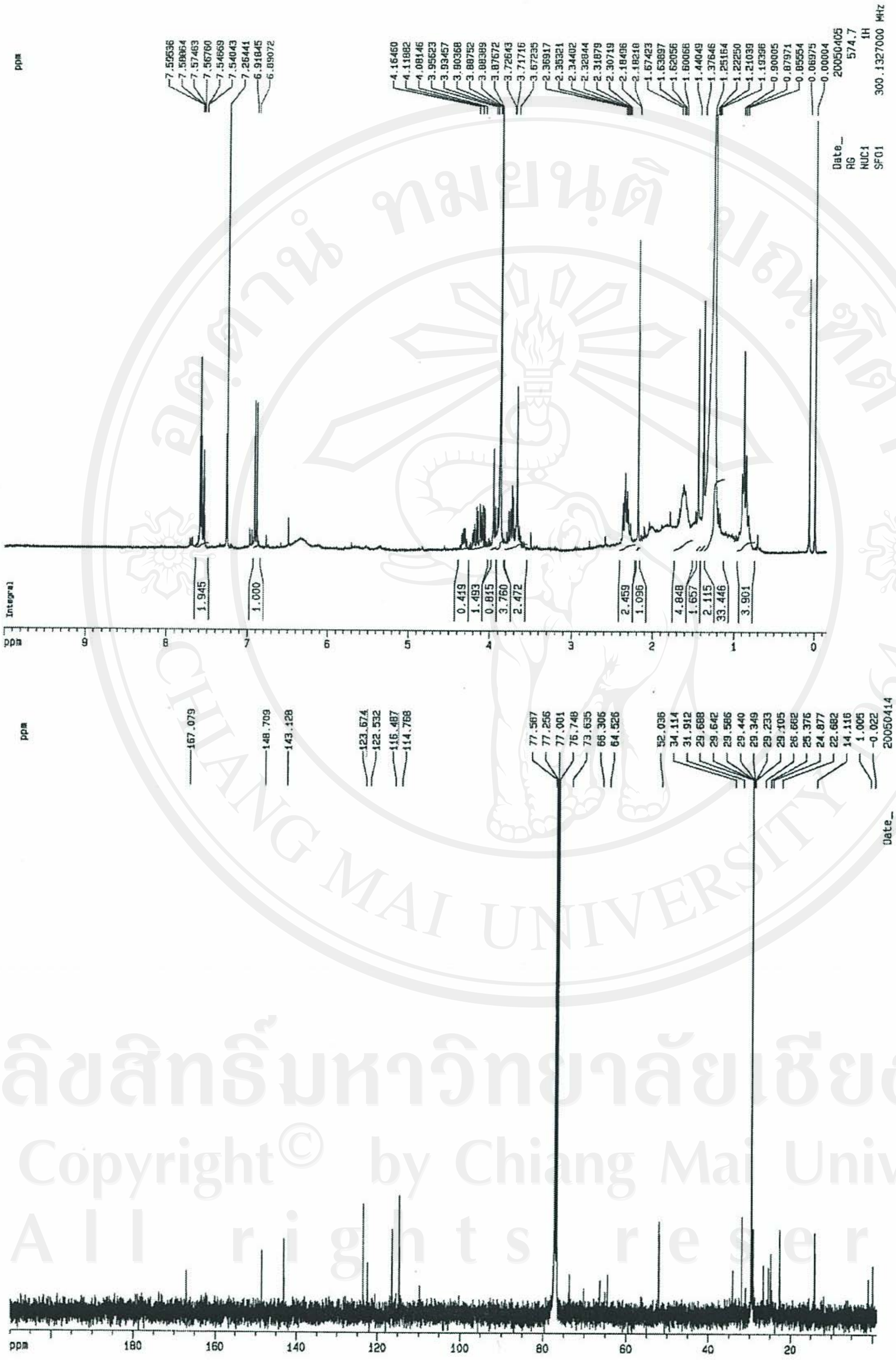

Figure C. 11 ^{1}H-, ^{13}C-NMR analysis of 1-(4-hydroxy-3-methoxyphenyl)-3-hydroxyl-propan-1-one

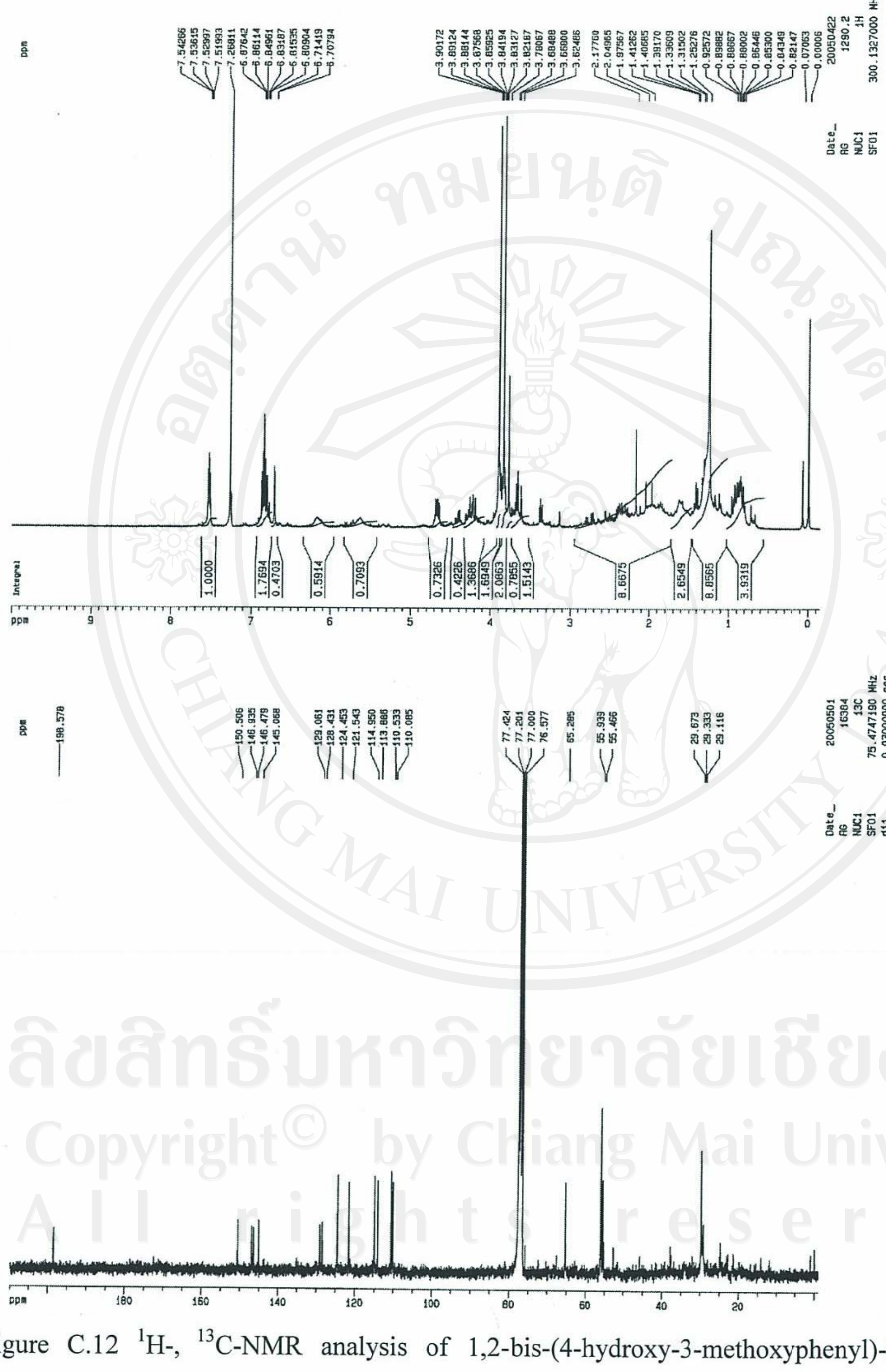

Figure C.12 ^{1}H-, ^{13}C-NMR analysis of 1,2-bis-(4-hydroxy-3-methoxyphenyl)-3-hydroxyl-propan-1-one

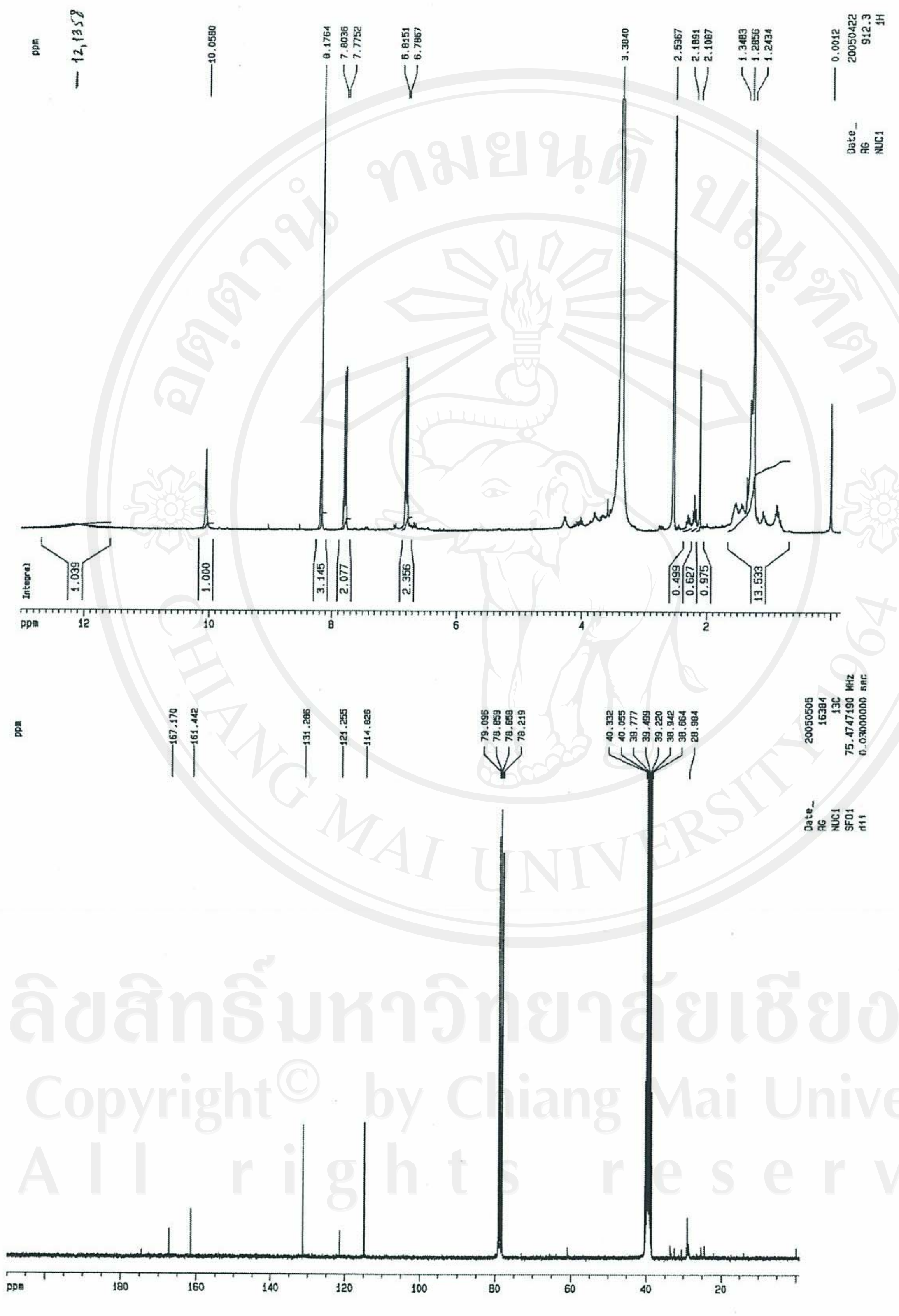

Figure C.13 ^{1}H-, ^{13}C-NMR analysis of 4-hydroxybenzoic acid

APPENDIX D

D.1 The 50% cell growth inhibition of isolated compounds and positive control on MCF-7, NCI-H460, SF-268 and UACC-62 cancer cell lines

Table D.1 the GI_{50} of the compounds from *H. hookerianum* on MCF-7 cell line

Compound	**HH1**	**HH2**	**HH3**	**HH4**	**HH5**
MW	242	242	436	316	618
GI50 (1)	20	35	25	4.3	7.1
GI50 (2)	29	27	22	6.3	7.9
GI50 (3)	21	17	25	4	7.7
GI50 (4)	25	18		4.5	
Average(µg/ml)	23.75	24.25	24.00	4.78	7.57
Molar (µM)	98.14	100.21	55.05	15.11	12.24
SD	4.11	8.46	1.73	1.04	0.42
SEM(µg/ml)	2.06	4.23	1.00	0.52	0.24
SEM(µM)	8.50	17.48	2.29	1.64	0.39

Table D.2 the GI_{50} of the compounds from *H. hookerianum* on NCI-H460 cell lines

Compound	**HH1**	**HH2**	**HH3**	**HH4**	**HH5**
MW	242	242	436	316	618
GI50 (1)	18	33	24	3.9	9.3
GI50 (2)	36	50	21	8.5	14
GI50 (3)	25	40	20	5.5	13
GI50 (4)	26	50		5.7	
Average(μg/ml)	26.25	43.25	21.67	5.90	12.10
Molar (μM)	108.47	178.72	49.69	18.67	19.58
SD	7.41	8.30	2.08	1.91	2.48
SEM(μg/ml)	3.71	4.15	1.20	0.96	1.43
SEM(μM)	15.31	17.15	2.76	3.02	2.31

Table D.3 the GI_{50} of the compounds from *H. hookerianum* on SF-268 cell line

Compound	**HH1**	**HH2**	**HH3**	**HH4**	**HH5**
MW	242	242	436	316	618
GI50 (1)	27	50	17	5.2	13
GI50 (2)	36	32	19	3.5	18
GI50 (3)	30	20	17	6.4	14
GI50 (4)	37	38			
Average(μg/ml)	32.50	35.00	17.67	5.03	15.00
Molar (μM)	134.30	144.63	40.52	15.93	24.27
SD	4.80	12.49	1.15	1.46	2.65
SEM(μg/ml)	2.40	6.24	0.67	0.84	1.53
SEM(μM)	9.91	25.81	1.53	2.66	2.47

Table D.4 the GI_{50} of the compounds from *H. hookerianum* on UACC-62 cell lines

Compound	**HH1**	**HH2**	**HH3**	**HH4**	**HH5**
MW	242	242	436	316	618
GI50 (1)	12	16	-	7	20
GI50 (2)	12	16	-	6.8	20
GI50 (3)	12	17	-	6.3	19
Average(μg/ml)	12.00	16.33	-	6.70	19.67
Molar (μM)	49.59	67.49	-	21.20	31.82
SD	0.00	0.58	-	0.36	0.58
SEM(μg/ml)	0.00	0.33	-	0.21	0.33
SEM(μM)	0.00	1.38	-	0.66	0.54

Table D.5 the GI_{50} of the compounds from *S.verrucolosa* on MCF-7 cell lines

Compound	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**
MW	168	264	152	122	168	152	318	138
GI50 (1)	31	>50	26	>50	13	>50	>50	>50
GI50 (2)	25	>50	23	>50	13	>50	>50	>50
GI50 (3)	32	>50	27	>50	16	>50	>50	>50
GI50 (4)	-	>50	29	>50	11	>50	>50	>50
Average(μg/ml)	29.30	>50	26.25	>50	13.25	>50	>50	>50
Molar (μM)	174.60	>189.39	172.70	>409.84	78.87	>328.95	>157.23	>362.32
SD	3.79	-	2.50	-	2.06	-	-	-
SEM(μg/ml)	2.20	-	1.25	-	1.03	-	-	-
SEM(μM)	13.00	-	8.22	-	6.14	-	-	-

Table D.6 the GI_{50} of the compounds from *S.verrucolosa* on NCI-H460 cell lines

Compound	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**
MW	168	264	152	122	168	152	318	138
GI50 (1)	>50	>50	27	>50	8.4	>50	>50	>50
GI50 (2)	>50	>50	25	>50	5	>50	>50	>50
GI50 (3)	>50	>50	29	>50	6.1	>50	>50	>50
GI50 (4)		>50	26	>50	6.4	>50	>50	>50
GI50 (5)			27		6.7			
Average(µg/ml)	>50	>50	26.80	>50	6.52	>50	>50	>50
Molar (µM)	297.62	>189.39	176.32	409.84	38.81	328.95	157.23	362.32
SD	-	-	1.48	-	1.23	-	-	-
SEM(µg/ml)	-	-	0.66	-	0.55	-	-	-
SEM(µM)	-	-	4.36	-	3.28	-	-	-

Table D.7 the GI_{50} of the compounds from *S.verrucolosa* on SF-268 cell lines

Compound	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**
GI50 (1)	50	>50	29	>50	12	>50	>50	>50
GI50 (2)	50	>50	28	>50	16	>50	>50	>50
GI50 (3)	47	>50	28	>50	16	>50	>50	>50
GI50 (4)	-	>50	25	>50	19	>50	>50	>50
Average(µg/ml)	49	>50	27.50	>50	15.75	>50	>50	>50
Molar (µM)	291.70	>189.39	180.92	409.84	93.75	328.95	157.23	362.32
SD	1.70	-	1.73	-	2.31	-	-	-
SEM(µg/ml)	1.00	-	0.87	-	1.33	-	-	-
SEM(µM)	6.00	-	5.70	-	7.94	-	-	-

Table D.8 The 50% growth inhibition of doxorubicin on cancer cell lines

Cell line	GI_{50} (1)	GI_{50} (2)	GI_{50} (3)	GI_{50} (4)	GI_{50} (5)	GI_{50} (6)	GI_{50} (7)	GI_{50} (8)	Average (nM)	SD	SEM
MCF-7	45	55	23	37	25	35	28	39	42.8	2.3	0.82
NCI-H460	79	93	110						94	1.5	0.87
SF-268	100	86							93	0.98	0.70
UACC-62	95	84	120	77					94	1.88	0.94

D.2 Lymphocyte proliferation assay and Cell vaiability

inhibitory activity of sample VS control

e.g. for the highest concentration of sample1 (A1,A2 and A3)

$$\text{Inhibition (\%)} = \mathbf{100} - \frac{\text{AverageOD}_{550}(\text{A1,A2}) - \text{OD}_{550}\ (\text{A3})}{\text{Av.OD}_{550}\ (\text{control}) - \text{Av.OD}_{550}\ (\text{reagent blank})} \times 100$$

Calculation of IC_{50}

IC_{50} is the concentration in the test system giving 50% inhibition

$$\text{Inhibition} = a * (\text{sampleconcentration}) + b$$

$$a = \frac{\text{Inhibition(conc2)} - \text{Inhibition (conc1)}}{\text{conc2} - \text{conc1}}$$

$$b = \text{Inhibition(conc1)} - a * \text{conc1}$$

conc 1: highest sample concentration giving **less** than 50% activity of control

conc 2: lowest sample concentration giving **more** than 50% activity of control

$$IC_{50} = \frac{50 - b}{a}$$

Table D.9 the IC_{50} of the compounds from *H. hookerianum* on human lymphocyte

Compound	HH1	HH2	HH3	HH4	HH5
IC50 (1)	42.68	44.21	>50	9.94	22.64
IC50 (2)	40.6	38.59	>50	8.68	21.83
IC50 (3)	39.23	35.33	>50	6.13	31.23
IC50 (4)		47.94			
Average(ug/ml)	40.84	41.52	>50	8.25	25.23
Molar (uM)	168.75	171.56	>114,68	26.11	40.83
SD	1.74	5.64	-	1.94	5.21
SEM(ug/ml)	1.00	2.82	-	1.12	3.01
SEM (uM)	4.14	11.65	-	3.55	4.87

Table D.10 the IC_{50} of the compounds from *S.verrucolosa* on human lymphocyte

Compound	S1	S2	S3	S4	S5	S6	S7	S8
IC50 (1)	>50	>50	>50	>50	7.18	>50	>50	>50
IC50 (2)	>50	>50	>50	>50	8.80	>50	>50	>50
IC50 (3)	>50	>50	>50	>50	10.46	>50	>50	>50
IC50 (4)	>50	>50	>50	>50	10.91	>50	>50	>50
Average(ug/ml)	>50	>50	>50	>50	9.34	>50	>50	>50
Molar(uM)	>297.62	>189.39	>328.95	>409.84	55.58	>328.95	>157.23	>362.32
SD	-	-	-	-	1.64	-	-	-
SEM(ug/ml)	-	-	-	-	0.95	-	-	-
SEM(uM)	-	-	-	-	5.64	-	-	-

Table D.11 Cell vaiability by trypan blue exclusion assay

Compound	viable cell	non viable cell	total cell	% viability	Average(%)
Control(1)	319	3	322	99.07	99.28
Control (2)	319	4	323	98.76	
Control (3)	284	0	284	100	
HH3 (1)	284	6	290	97.93	98.90
HH3 (2)	391	1	392	99.74	
HH3 (3)	307	3	310	99.03	
HH4 (1)	292	1	293	99.66	99.57
HH4 (2)	339	2	341	99.41	
HH4 (3)	280	1	281	99.64	
S3 (1)	400	2	402	99.50	99.39
S3 (2)	268	2	207	99.26	
S3 (3)	332	2	334	99.40	

CURRICULUM VITAE

Name	Captain Rujida Wilairat (Ms.)	
Date of birth	5 April 1975	
Place of birth	Uttaradit, Thailand	
Education	2000-2002	M.A. in Man and Environment Management Chiang Mai University, Chiang Mai, Thailand
	1998-2001	B.Sc in Political Science Sukhothai Thammathirat Open University Nonthaburi, Thailand
	1993-1998	B.Sc. in Pharmacy (Hons.) Chiang Mai University, Chiang Mai, Thailand
	1987-1993	Secondary School Certificate Bunyawatvittayalai Secondary School Lampang, Thailand
Address	Department of Pharmacy, Phramongkutklao Hospital, Bangkok, Thailand	

Scholarships and awards

- Bronze Medal Award from the Faculty of Pharmacy, 1997 (Chiang Mai University)
- The Royal Golden Jubilee under Ph D Program, 2002-2007 (Thailand Research Fund)

List of presentations

1. Jiradej Manosroi, **Rujida Wilairat**, Anake Kijjoa and Aranya Manosroi. The screening of free radical scavenging activity of extracts from Thai medicinal plants in Guttiferae and Schisandracea family. 30th Congress on Science and Technology of Thailand, Impact Exhibition and Convention Center, Muang Thong Thani, Bangkok, Thailand, October 19-21, 2004. (Poster presentation, H0021)

2. **Rujida Wilairat**, Jiradej Manosroi, Aranya Manosroi, Madalena Pinto, Maria São José Nascimento and Anake Kijjoa. Cytotoxicity and inhibition of lymphocyte proliferation of xanthones and cinnamate esters from *Hypericum hookerianum*. 53rd Annual Meeting of the society for Medicinal Plants Research. Florence, Italy, August 21-25, 2005. (Poster presentation, P 457)

3. Jiradej Manosroi, **Rujida Wilairat**, Anake Kijjoa and Aranya Manosroi. *In vitro* antitumor activity of extracts from Thai plants in Guttiferae and Schisandraceae families on human tumor cell lines. RGJ-Ph.D. Congress VII. Pattaya, Chonburi, April 20-22, 2006. (Poster presentation, S3-P42)

List of plubications

1. Jiradej Manosroi, **Rujida Wilairat**, Anake Kijjoa, Aranya Manosroi. Free radical scavenging activity of extracts from Thai plants in Guttiferae and Schisandraceae families. *Pharm Bio*. 2005; 43: 324-329.

2. **Rujida Wilairat**, Jiradej Manosroi, Aranya Manosroi, Anake Kijjoa, Maria São José Nascimento, Madalena Pinto, Artur M.S. Silva, Graham Eaton and Werner Herz. Cytotoxixities of xanthones and cinnamate esters from *Hypericum hookerianum. Planta Med.* 2005; 71: 680-682.

3. Jiradej Manosroi, **Rujida Wilairat**, Aranya Manosroi. *In vitro* antitumor activity of extracts from Thai plants in Guttiferae and Schisandraceae families on human cancer cell lines. *RTA. Med. J.* 2006 (inpress).