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## **APPENDICES**

## APPENDICES

## APPENDIX A

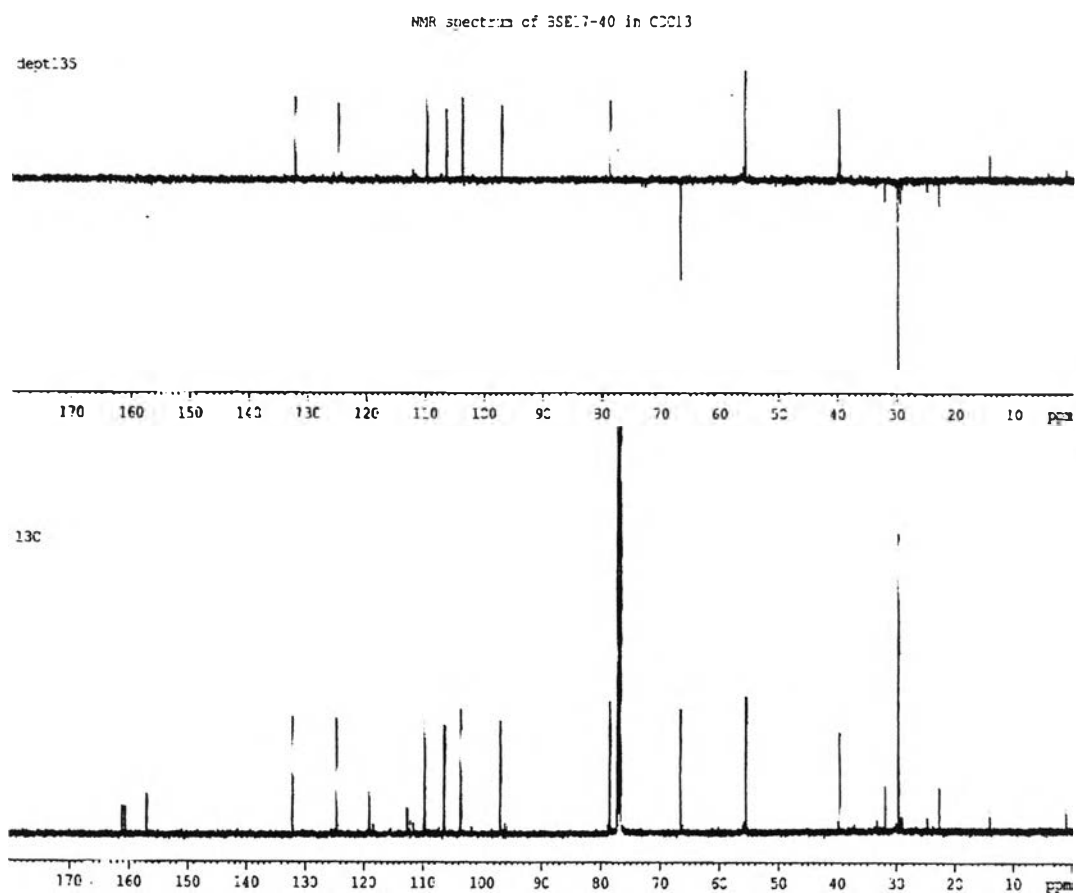


Figure 14. DEPT spectra of BS 1.

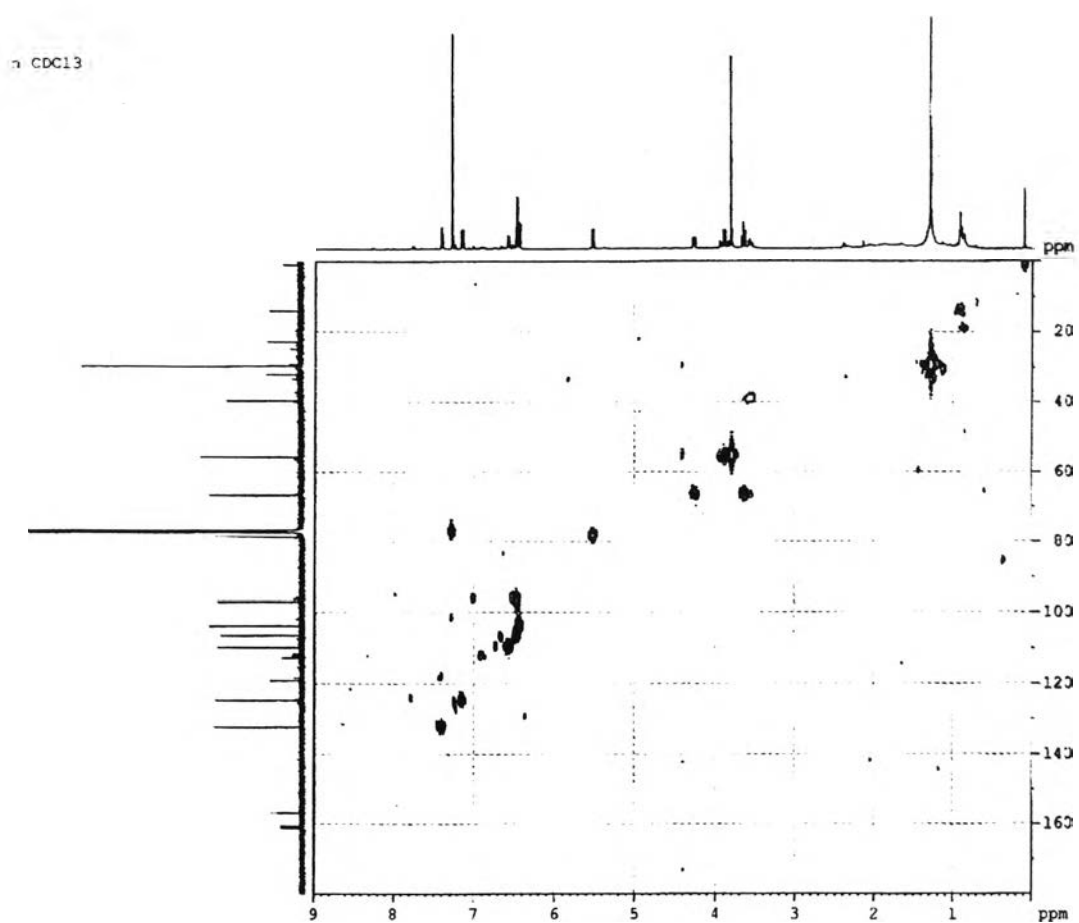


Figure 15. HMQC spectra of BS 1.

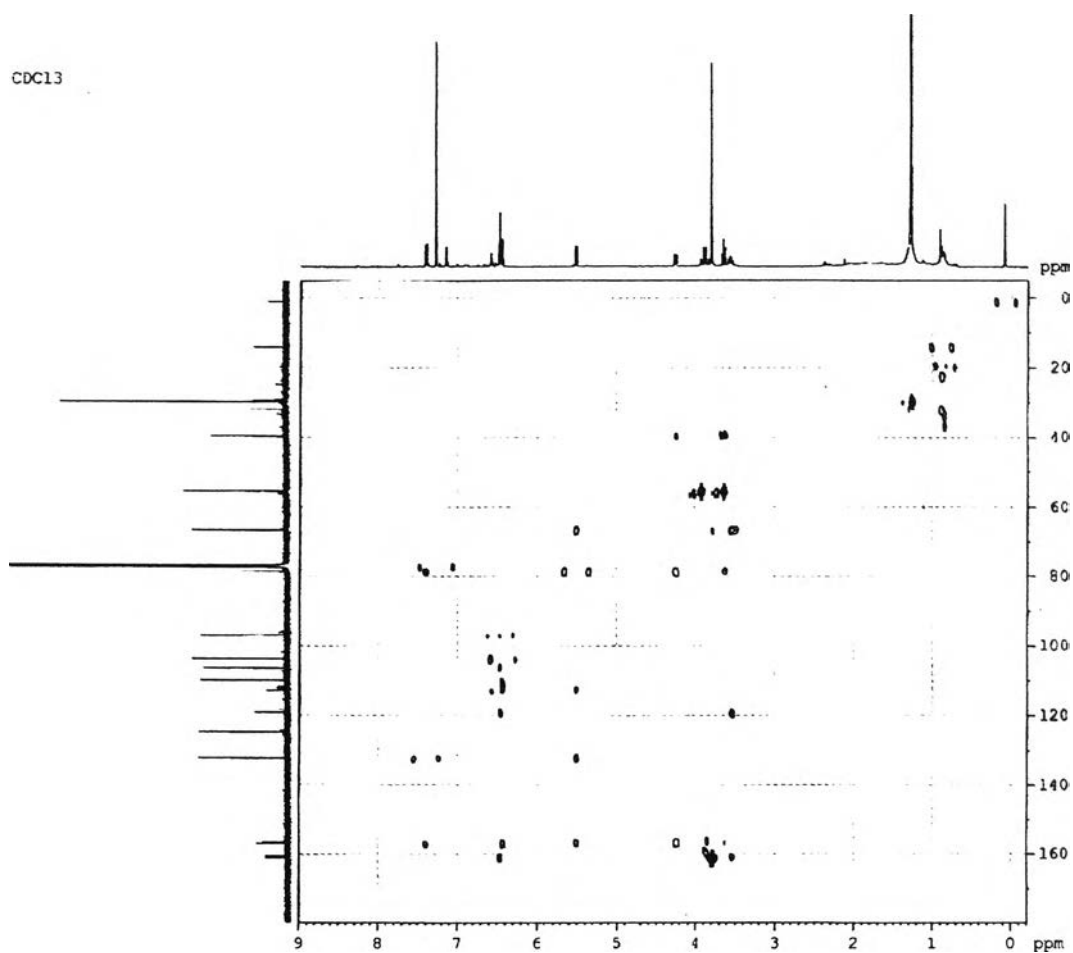


Figure 16. HMBC spectra of BS 1.

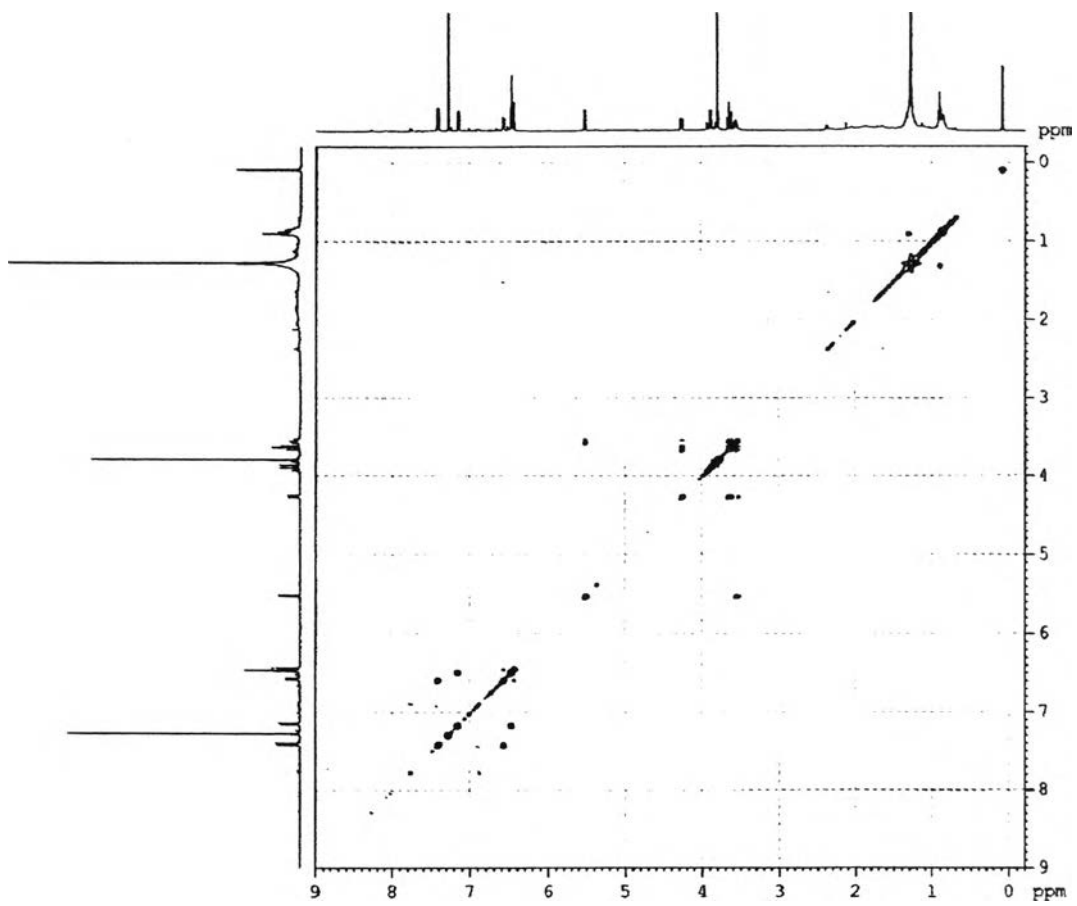


Figure 17. COSY spectra of BS 1.

**APPENDICES****APPENDIX B**

Table 16. Calibration data of medicarpin in methanol solution at 287 nm.

Concentration ( $\mu\text{g/ml}$ )	Peak area
0.12	1015
0.24	2162
0.48	5120
0.96	10134
1.44	15070
1.92	20864
2.40	26053
2.88	31787
4.32	47678
4.80	52980

Table 17. Water content in *Butea superba* fluidextract.

Fluidextracts	Before drying	After drying	%Water content
50% ethanol	10.51	9.28	11.70
	10.88	9.69	10.93
	10.96	9.75	11.04
			Mean = 11.31 SD =0.385 RSD =3.40
95%ethanol	10.69	9.33	12.72
	10.24	9.05	11.62
	10.15	8.91	12.21
			Mean = 12.18 SD =0.449 RSD =3.68

Table 19. The moisture content of dry powder *Butea superba* extract.

Formulation	% Moisture content
F1-BS-95	8.73 ± 0.31
F2-BS-95	7.62 ± 0.29
F3-BS-95	8.13 ± 0.37
F4-BS-95	8.43 ± 0.41
F1-BS-50	7.33 ± 0.34
F2-BS-50	6.29 ± 0.32
F3-BS-50	6.43 ± 0.38
F4-BS-50	7.21 ± 0.46
F5-BS-50	7.57 ± 0.29
F6-BS-50	6.34 ± 0.44
F7-BS-50	6.25 ± 0.48
F8-BS-50	6.71 ± 0.33

Table 20. Bulk density, Tapped density and Carr's index of dry powder of *Butea superba* 50% and 95% ethanolic extracts.

Formulation	Bulk density	Tapped density	Carr's index
F1-BS-95	0.31 ± 0.01	0.38 ± 0.01	18.73 ± 0.11
F2-BS-95	0.28 ± 0.02	0.37 ± 0.01	25.12 ± 0.24
F3-BS-95	0.26 ± 0.01	0.33 ± 0.01	21.50 ± 0.37
F4-BS-95	0.27 ± 0.02	0.35 ± 0.01	23.47 ± 0.29
F1-BS-50	0.31 ± 0.01	0.36 ± 0.01	16.13 ± 0.13
F2-BS-50	0.27 ± 0.01	0.35 ± 0.01	23.56 ± 0.32
F3-BS-50	0.27 ± 0.01	0.36 ± 0.01	24.87 ± 0.21
F4-BS-50	0.28 ± 0.01	0.37 ± 0.01	23.81 ± 0.44
F5-BS-50	0.24 ± 0.01	0.30 ± 0.01	19.05 ± 0.19
F6-BS-50	0.28 ± 0.01	0.37 ± 0.01	23.53 ± 0.41
F7-BS-50	0.27 ± 0.01	0.36 ± 0.01	25.14 ± 0.46
F8-BS-50	0.31 ± 0.01	0.37 ± 0.01	16.66 ± 0.16



Table 22. Flow rates of dry extract of *Butea superba* 50% and 95% ethanolic granules.

Formulation	Flow rate (g/sec)
F1-BS-95	0.50 ± 0.06
F2-BS-95	0.49 ± 0.07
F3-BS-95	0.53 ± 0.10
F4-BS-95	0.55 ± 0.12
F1-BS-50	0.47 ± 0.11
F2-BS-50	0.43 ± 0.19
F3-BS-50	0.54 ± 0.15
F4-BS-50	0.53 ± 0.17
F5-BS-50	0.62 ± 0.13
F6-BS-50	0.51 ± 0.22
F7-BS-50	0.57 ± 0.25
F8-BS-50	0.64 ± 0.21

Table 5 Diameter and thickness of *Butea superba* 50% and 95% ethanolic extract tablet compared to Dokwhan<sup>®</sup> tablets (DW).

Formulation	Diameter (mm)	Thickness (mm)
F1-BS-95	9.63 ± 0.01	4.07 ± 0.08
F2-BS-95	9.64 ± 0.01	4.11 ± 0.07
F3-BS-95	9.63 ± 0.01	4.09 ± 0.10
F4-BS-95	9.66 ± 0.01	4.12 ± 0.10
F1-BS-50	9.67 ± 0.01	4.10 ± 0.08
F2-BS-50	9.66 ± 0.01	4.13 ± 0.12
F3-BS-50	9.65 ± 0.01	4.07 ± 0.09
F4-BS-50	9.66 ± 0.01	4.15 ± 0.14
F5-BS-50	9.67 ± 0.01	4.10 ± 0.10
F6-BS-50	9.65 ± 0.01	4.13 ± 0.09
F7-BS-50	9.64 ± 0.01	4.12 ± 0.08
F8-BS-50	9.65 ± 0.01	4.09 ± 0.11
DW	11.28 ± 0.01	5.55 ± 0.04

Table 29. Friability of *Butea superba* 50% and 95% ethanolic extract tablet compared to Dokwhan® tablets (DW).

Formulation	% Friability
F1-BS-95	0.49 ± 0.07
F2-BS-95	0.37 ± 0.11
F3-BS-95	8.05 ± 0.24
F4-BS-95	3.67 ± 0.35
F1-BS-50	6.58 ± 0.31
F2-BS-50	3.19 ± 0.23
F3-BS-50	4.45 ± 0.19
F4-BS-50	5.56 ± 0.37
F5-BS-50	0.68 ± 0.09
F6-BS-50	5.40 ± 0.42
F7-BS-50	5.31 ± 0.35
F8-BS-50	2.32 ± 0.21
DW	0.86 ± 0.12

Table 30. Hardness of *Butea superba* 50% and 95% ethanolic extract tablets compared to Dokwhan<sup>®</sup> tablets (DW).

Formulation	Hardness (kp)
F1-BS-95	5.82 ± 1.04
F2-BS-95	11.60 ± 2.13
F3-BS-95	2.50 ± 0.75
F4-BS-95	5.48 ± 1.14
F1-BS-50	3.70 ± 1.09
F2-BS-50	4.00 ± 0.35
F3-BS-50	2.54 ± 0.83
F4-BS-50	5.94 ± 1.37
F5-BS-50	5.72 ± 0.52
F6-BS-50	4.10 ± 0.93
F7-BS-50	5.25 ± 1.21
F8-BS-50	3.72 ± 0.77
DW	2.42 ± 0.52

Table 31. Weight variation of *Butea superba* 50% and 95% ethanolic extract tablets compared to Dokwhan<sup>®</sup> tablets (DW).

Formulation	Average weight (mg)	% Variation
F1-BS-95	437.82	± 0.88
F2-BS-95	436.42	± 0.55
F3-BS-95	431.89	± 0.48
F4-BS-95	435.30	± 0.29
F1-BS-50	433.61	± 0.08
F2-BS-50	416.98	± 3.02
F3-BS-50	437.79	± 0.87
F4-BS-50	439.41	± 1.24
F5-BS-50	436.04	± 0.47
F6-BS-50	435.09	± 0.25
F7-BS-50	432.93	± 0.24
F8-BS-50	441.04	± 1.62
DW	610.05	± 1.67

Table 32. Disintegration time of *Butea superba* 50% and 95% ethanolic extract tablets compared to Dokwhan<sup>®</sup> tablets (DW).

Formulation	Disintegration time (min)
F1-BS-95	10.11 ± 2.35
F2-BS-95	12.37 ± 2.11
F3-BS-95	12.18 ± 2.36
F4-BS-95	11.23 ± 3.12
F1-BS-50	12.42 ± 2.19
F2-BS-50	10.19 ± 3.47
F3-BS-50	9.23 ± 3.17
F4-BS-50	11.41 ± 3.04
F5-BS-50	8.30 ± 2.01
F6-BS-50	7.53 ± 3.43
F7-BS-50	12.35 ± 2.09
F8-BS-50	12.53 ± 1.34
DW	22.40 ± 3.31

Table 37. Dissolution of 50% and 95% ethanolic *Butea superba* extract tablets (F5-BS-50 and F1-BS-95).

Formulation	%Drug released at 30 min						Mean	SD	RSD
	No.1	No.2	No.3	No.4	No.5	No.6			
F5-BS-50	93.45	95.57	97.84	100.20	99.91	101.0	97.99	2.71	2.76
F1-BS-95	94.65	98.81	96.89	101.27	102.09	103.26	99.49	3.02	3.03

## VITA

Mr.Petchpong Petcharee was born on March 30<sup>th</sup>, 1979 in Bangkok, Thailand. He has recieved his Bachelor of Pharmaceutical Sciences in 2003 from the Faculty of Pharmaceutical Sciences, Rangsit University, Pathumthanee, Thailand.