



APPENDICES

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่

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APPENDIX A

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่

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Appendix Table 1 The percentage of mycelial inhibition versus controls of four longan fruit decay fungi, *Lasiodiplodia* sp., *Pestalotiopsis* sp., *Phomopsis* sp. and *Curvularia* sp., fumigated with *trans*-2 hexanal at five concentrations *in vitro*.

Conc. $\mu\text{l l}^{-1}$	% mycelium inhibition			
	<i>Lasiodiplodia</i> sp.	<i>Pestalotiopsis</i> sp.	<i>Phomopsis</i> sp.	<i>Curvularia</i> sp.
	day 3	day 7	day 7	day 10
0	0 c	0 d	0 d	0 b
33	71 b	7 cc	11 c	100 a
66	100 a	5 c	48 b	100 a
132	100 a	46 b	100 a	100 a
198	100 a	100 a	100 a	100 a
264	100 a	100 a	100 a	100 a
CV (%)	2.35	6.06	4.47	0.55

Means within the same column followed by the same letter did not significantly differ ($P=0.05$) by LSD.

Appendix Table 2 The percentage of mycelial inhibition versus controls of four longan fruit decay fungi, *Lasiodiplodia* sp., *Pestalotiopsis* sp., *Phomopsis* sp. and *Curvularia* sp., fumigated with hexanal at six concentrations *in vitro*.

Conc. $\mu\text{l l}^{-1}$	% mycelium inhibition			
	<i>Lasiodiplodia</i> sp.	<i>Pestalotiopsis</i> sp.	<i>Phomopsis</i> sp.	<i>Curvularia</i> sp.
	day 3	day 7	day 7	day 10
0	0 d	0 d	0 e	0 e
66	11 c	20 c	10 d	17 d
132	31 b	23 c	18 c	37 c
198	100 a	33 b	41 b	63 b
264	100 a	100 a	100 a	100 a
396	100 a	100 a	100 a	100 a
660	100 a	100 a	100 a	100 a
CV (%)	4.11	10.72	3.00	4.39

Means within the same column followed by the same letter did not significantly differ ($P=0.05$) by LSD.

Appendix Table 3 The percentage of mycelial inhibition versus controls of four longan fruit decay fungi, *Lasiodiplodia* sp., *Pestalotiopsis* sp., *Phomopsis* sp. and *Curvularia* sp., fumigated with 2-nonanone at six concentrations *in vitro*.

Conc. $\mu\text{l l}^{-1}$	% mycelium inhibition			
	<i>Lasiodiplodia</i> sp.	<i>Pestalotiopsis</i> sp.	<i>Phomopsis</i> sp.	<i>Curvularia</i> sp.
	day 3	day 7	day 7	day 10
0	0 f	0 f	0 f	0 g
66	20 e	29 e	1 f	26 f
132	42 d	49 d	27 e	43 e
198	80 c	80 c	34 d	53 d
264	83 b	87 b	40 c	59 c
396	98 a	100 a	84 b	67 b
660	100 a	100 a	100 a	100 a
CV (%)	3.82	4.44	8.80	4.99

Means within the same column followed by the same letter did not significantly differ ($P=0.05$) by LSD.

Appendix Table 4 The percentage of mycelial inhibition versus controls of four longan fruit decay fungi, *Lasiodiplodia* sp., *Pestalotiopsis* sp., *Phomopsis* sp. and *Curvularia* sp., fumigated with methyl benzoate at six concentrations *in vitro*.

Conc. $\mu\text{l l}^{-1}$	% mycelium inhibition			
	<i>Lasiodiplodia</i> sp.	<i>Pestalotiopsis</i> sp.	<i>Phomopsis</i> sp.	<i>Curvularia</i> sp.
	day 3	day 7	day 7	day 10
0	0 f	0 f	0 d	0 f
66	15 e	12 e	8 c	52 e
132	16 e	30 d	7 c	66 d
198	22 d	48 c	50 b	86 c
264	59 c	84 b	52 b	92 b
396	69 b	100 a	100 a	100 a
660	72 a	100 a	100 a	100 a
CV (%)	6.46	4.36	4.69	2.34

Means within the same column followed by the same letter did not significantly differ ($P=0.05$) by LSD.

Appendix Table 5 The percentage of mycelial inhibition versus controls of four longan fruit decay fungi, *Lasiodiplodia* sp., *Pestalotiopsis* sp., *Phomopsis* sp. and *Curvularia* sp., fumigated with methyl salicylate at six concentrations *in vitro*.

Conc. $\mu\text{l l}^{-1}$	% mycelium inhibition			
	<i>Lasiodiplodia</i> sp.	<i>Pestalotiopsis</i> sp.	<i>Phomopsis</i> sp.	<i>Curvularia</i> sp.
	day 3	day 7	day 7	day 10
0	0 e	0 d	0 e	0 f
66	14 d	44 c	1 e	47 e
132	19 c	72 b	18 d	65 d
198	19 c	100 a	23 c	79 c
264	19 c	100 a	26 c	88 b
396	24 b	100 a	29 b	100 a
660	27 a	100 a	43 a	100 a
CV (%)	10.80	1.91	11.61	2.71

Means within the same column followed by the same letter did not significantly differ ($P=0.05$) by LSD.

Appendix Table 6 Percentage weight loss of longan fruit cv. Daw stored at 5°C after hexanal fumigation at 900 $\mu\text{l l}^{-1}$ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	0	1.10 a	1.95 a	2.41 b	3.20 a	4.05 a	4.56 a	4.70 a	5.77 a	
Hexanal	0	1.27 a	1.73 a	2.64 a	3.33 a	3.86 a	4.34 a	4.98 a	5.58 ab	
Coating*	0	1.07 a	1.94 a	2.66 a	3.48 a	4.00 a	4.31 a	4.82 a	5.86 a	
Coating* + hexanal	0	1.24 a	1.96 a	2.78 a	3.28 a	3.94 a	4.27 a	4.67 a	5.28 b	
C.V. (%)		13.24	15.61	5.38	8.35	8.73	8.11	8.54	5.04	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison

Appendix Table 7 Total soluble solid (% Brix) of longan fruit aril cv. Daw stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	15.99 a	15.49 a	16.13 a	15.05 a	16.24 a	16.94 a	15.14 a	15.14 a	15.14 a	15.46 a
Hexanal	15.84 a	15.40 a	15.55 a	15.22 a	15.19 a	14.65 b	15.23 a	15.15 a	15.15 a	14.62 a
Coating*	16.34 a	16.26 a	16.70 a	16.65 a	16.95 a	16.76 a	16.27 a	16.34 a	16.34 a	15.05 a
Coating* + hexanal	15.92 a	16.89 a	15.13 a	16.50 a	16.75 a	16.43 ab	16.10 a	15.68 a	15.68 a	16.15 a
C.V. (%)		6.05	8.82	10.41	7.41	7.19	7.45	6.59	6.59	11.71

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison

Appendix Table 8 pH of longan fruit pericarp cv. Daw stored at 5°C after hexanal fumigation at 900 $\mu\text{l l}^{-1}$ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	5.22 b	5.32 a	5.50 a	5.55 a	5.52 a	5.36 a	5.40 a	5.27 a	5.35 a	
Hexanal	5.3 ab	5.35 a	5.40 a	5.35 b	5.32 b	5.00 b	5.12 c	4.97 b	5.07 b	
Coating*	5.32 a	5.37 a	5.47 a	5.57 a	5.52 a	5.27 a	5.32 ab	5.27 a	5.37 a	
Coating* + hexanal	5.35 a	5.35 a	5.50 a	5.45 ab	5.35 ab	5.07 b	5.20 bc	4.97 b	5.12 b	
C.V. (%)	1.16	1.27	1.73	1.81	2.21	2.20	1.69	1.87	1.49	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different

Comparison

Appendix Table 9 pH of longan fruit aril cv. Daw stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	7.20 a	7.12 a	7.00 a	7.05 a	7.15 a	7.02 ab	7.15 a	7.15 a	7.15 a	7.07 a
Hexanal	7.10 a	6.97 a	6.85 b	6.95 b	7.10 a	6.95 b	6.97 b	6.90 b	6.90 b	6.75 b
Coating*	7.20 a	7.07 a	6.97 a	7.05 a	7.15 a	7.10 a	7.12 a	7.20 a	7.20 a	7.10 a
Coating* + hexanal	7.20 a	7.02 a	6.97 a	7.05 a	7.12 a	6.92 b	7.07 ab	7.07 ab	7.07 ab	6.85 b
C.V. (%)	1.66	2.05	1.06	0.82	0.88	1.34	1.24	1.72	1.72	1.70

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % (P≤0.05) level by Least Significant Different

Comparison

Appendix Table 10 Electrolyte leakage of longan fruit pericarp cv. Daw stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	12.42 a	10.50 a	11.96 a	11.85 a	14.33 a	18.30 a	19.13 a	20.65 a	23.30 a	
Hexanal	32.49 b	34.80 b	40.93 c	39.55 b	36.75 b	41.48 b	40.91 b	34.92 b	43.40 b	
Coating*	12.09 a	10.09 a	12.05 a	16.71 a	17.11 a	18.71 a	24.98 a	23.40 a	23.32 a	
Coating* + hexanal	36.00 b	37.31 b	33.35 b	37.27 b	34.94 b	39.53 b	39.98 b	34.28 b	41.82 b	
C.V. (%)	12.01	16.85	13.10	15.82	12.86	16.43	18.06	10.40	9.07	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison

Appendix Table 11 Firmness (Newton) of longan fruit aril cv. Daw stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	0.98 a	1.11 a	0.94 b	1.00 a	1.07 a	0.89 a	1.07 ab	1.30 a	1.24 a	
Hexanal	1.14 a	1.14 a	0.97 b	1.14 a	1.01 a	1.10 a	1.07 ab	1.07 a	1.11 a	
Coating*	0.89 a	1.04 a	1.07 b	0.99 a	1.00 a	0.97 a	0.95 b	1.26 a	1.01 a	
Coating* + hexanal	1.0 a	1.11 a	1.36 a	1.11 a	1.07 a	1.04 a	1.25 a	1.10 a	1.06 a	
C.V. (%)	16.74	12.65	14.46	19.07	19.38	15.91	12.99	19.76	18.63	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison

Appendix Table 12 L* value of outer longan fruit pericarp cv. Daw stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	53.54	55.99 a	51.10 a	49.81 a	49.64 a	46.78 a	46.85 a	43.83 a	45.10 a	
Hexanal	53.54	50.99 b	46.59 b	43.62 b	45.35 b	43.76 a	45.64 a	42.14 ab	42.01 b	
Coating*	53.54	55.63 a	50.32 a	47.65 a	48.27 a	46.64 a	45.16 a	42.55 ab	42.34 b	
Coating* + hexanal	53.54	52.03 b	44.76 b	44.55 b	46.59 b	44.28 a	44.31 a	41.73 b	42.24 b	
C.V. (%)		5.04	3.64	3.57	2.00	4.79	3.75	2.60	3.73	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different

Comparison

Appendix Table 13 Chroma value of outer longan fruit pericarp cv. Daw stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	20.78	21.79 a	22.17 a	20.90 a	22.29 a	20.33 a	19.34 a	20.54 a	19.19 a	
Hexanal	20.78	15.04 b	16.72 b	15.583b	16.37 b	16.52 a	16.05 b	17.58 b	18.41 a	
Coating*	20.78	21.61 a	23.10 a	20.72 a	20.93 a	20.97 a	19.92 a	17.62 b	17.39 a	
Coating* + hexanal	20.78	15.14 b	15.79 b	15.92 b	17.50 b	16.39 a	16.72 b	18.34 ab	18.36 a	
C.V. (%)		4.25	5.96	5.61	5.94	4.92	5.85	7.76	7.38	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 %(P≤0.05) level by Least Significant Different

Comparison

Appendix Table 14 Hue angle of outer longan fruit pericarp cv. Daw stored at 5°C after hexanal fumigation at 900 $\mu\text{l}\cdot\text{l}^{-1}$ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	64.96	64.74 a	63.85 a	61.66 a	73.59 a	58.88 a	56.64 a	60.14 a	57.97 a	
Hexanal	64.96	53.87 b	51.89 b	50.54 b	66.72 b	51.46 b	52.08 b	56.65 bc	53.96 b	
Coating*	64.96	65.59 a	61.84 a	60 a	72.35 a	59.50 a	54.05 ab	57.85 ab	54.60 b	
Coating* + hexanal	64.96	53.04 b	50.54 b	51.45 b	68.07 b	50.11 b	51.13 b	54.96 c	54.01 b	
C.V. (%)		3.78	3.11	3.25	1.49	3.29	4.29	2.87	2.77	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison

Appendix Table 15 L* value of inner longan fruit pericarp cv. Daw stored at 5°C after hexanal fumigation at 900 $\mu\text{l l}^{-1}$ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	78.05	80.66 a	80.52a	79.39 a	76.06 a	74.91 a	74.53 a	67.87 a	67.79 a	
Hexanal	78.05	60 b	61.15 b	57.90 b	56.65 b	55.49 b	54.78 b	51.22 c	53.25 b	
Coating*	78.05	79.20 a	81.10 a	76.41 a	74.47 a	73.62 a	71.38 a	60.61 b	66.14 a	
Coating* + hexanal	78.05	61.00 b	62.51 b	59.01 b	54.74 b	56.23 b	54.23 b	51.59 c	53.17 b	
C.V. (%)		4.26	3.46	4.85	3.20	2.96	5.43	3.39	6.25	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different

Comparison

Appendix Table 16 C value of inner longan fruit pericarp cv. Daw stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	20.10	20.57 b	22.12 b	20.64 b	22.10 b	22.75 b	22.95 b	25.45 b	23.36 b	
Hexanal	20.10	26.12 a	26.74 a	26.84a	26.60 a	25.47 a	25.60 a	29.84 a	26.95 a	
Coating*	20.10	21.41 b	21.85 b	20.53 b	22.82 b	22.52 b	23.24 b	26.50 b	24.02 b	
Coating* + hexanal	20.10	27.54 a	28.03 a	26.24 a	27.46 a	26.59 a	26.01 a	29.72 a	27.08 a	
C.V. (%)		5.77	4.02	5.93	5.23	3.81	4.27	3.97	5.43	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different

Comparison

Appendix Table 17 Hue angle of inner longan fruit pericarp cv. Daw stored at 5°C after hexanal fumigation at 900 $\mu\text{l l}^{-1}$ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	81.30	82.12 a	80.32 a	79.88 b	78.70 a	76.80 a	77.04 a	74.74 a	72.93 a	
Hexanal	81.30	71.54 b	68.08 a	66.31 a	65.41 b	64.17 b	63.24 b	64.71 c	63.19 b	
Coating*	81.30	81.12 a	80.69 a	86.59 b	76.94 a	75.91 a	74.61 a	70.39 b	72.21 a	
Coating* + hexanal	81.30	70.48 b	68.96 b	66.30 a	64.51 b	64.32 b	63.09 b	64.71 c	62.75 a	
C.V. (%)		1.87	1.76	10.57	1.61	1.92	3.17	1.63	3.74	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different

Comparison

Appendix Table 18 L* value of longan aril cv. Daw stored at 5°C after hexanal fumigation at 900 $\mu\text{l l}^{-1}$ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	34.21	34.38 a	35.57 a	33.57 b	31.88 ab	32.54 ab	33.98 a	28.49 a	35.00 a	
Hexanal	34.21	33.00 a	33.87 a	36.42 a	32.86 a	34.20 a	34.24 a	28.22 ab	32.06 a	
Coating*	34.21	34.00 a	34.54 a	33.64 b	30.63 b	31.75 ab	34.61 a	28.34 ab	31.52 a	
Coating* + hexanal	34.21	34.66 a	34.14 a	33.85 b	31.29 ab	30.64 b	33.09 a	26.54 b	34.58 a	
C.V. (%)		9.70	4.97	4.19	3.86	5.33	21.14	4.27	8.65	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison

Appendix Table 19 C value of longan aril cv. Daw stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	1.35	1.23 a	1.06 a	0.90 a	1.02 a	0.89 a	1.07 ab	1.92 a	1.07 a	
Hexanal	1.35	1.47 a	1.07 a	1.07 a	0.94 a	0.84 a	0.88 b	2.28 a	1.11 a	
Coating*	1.35	1.24 a	0.93 a	0.91 a	0.99 a	1.30 a	1.18 a	1.80 a	1.32 a	
Coating* + hexanal	1.35	1.41 a	1.20 a	1.19 a	0.61 a	0.99 a	1.02 ab	2.14 a	0.91 a	
C.V. (%)		28.71	19.15	23.54	42.44	28.79	17.41	26.45	33.39	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison

Appendix Table 20 Hue angle of longan aril cv. Daw stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	0	3	6	9	12	15	18	21	24	
Control	159.34	167.88 a	127.28 a	200.80 a	166.18 a	195.63 ab	181.10 a	161.05 a	160.04 a	
Hexanal	159.34	164.35 a	152.11 a	160.95 a	168.90 a	169.62 b	184.64 a	178.10 a	149.24 a	
Coating*	159.34	159.09 a	156.14 a	208.64 a	175.79 a	209.19 ab	196.78 a	163.00 a	158.31 a	
Coating* + hexanal	159.34	165.26 a	153.80 a	210.90 a	142.41 a	222.68 a	221.11 a	196.29 a	197.82 a	
C.V. (%)		14.11	15.30	17.28	18.09	13.13	23.90	25.61	26.79	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison

Appendix Table 21 Hexanal residue ($\mu\text{g/g}$) in longan fruit pericarp cv. Daw stored at 5°C after hexanal fumigation at $900 \mu\text{l l}^{-1}$ for 2 h at ambient temperature.

Treatment	Days of storage at 5°C^{**}									
	0	3	6	9	12	15	18	21	24	
Control	0.74 b	0.53 b	1.04 c	0.92 c	0.28 a	0.10 c	0.25 b	0.08 b	0.04 b	
Hexanal	8.20 a	10.85 a	7.88 a	7.25 b	7.69 a	6.13 b	5.66 a	4.67 a	3.63 a	
Coating*	1.57 b	1.34 b	1.62 c	0.51 c	0.39 b	0.11 c	0.06 b	0.07 b	0 b	
Coating* + hexanal	10.56 a	10.74 a	6.22 b	10.87 a	7.30 a	8.32 a	5.50 a	4.55 a	3.68 a	
C.V. (%)	27.33	28.48	22.84	11.43	15.73	24.87	24.27	26.77	19.12	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison

Appendix Table 22 Hexanal residue ($\mu\text{g/g}$) in longan fruit aril cv. Daw stored at 5°C after hexanal fumigation at $900 \mu\text{l l}^{-1}$ for 2 h at ambient temperature.

Treatment	Days of storage at 5°C^{**}									
	0	3	6	9	12	15	18	21	24	
Control	0 b	0 b	0 c	0 c	0 b	0 b	0.02 b	0.01 c	0 c	
Hexanal	2.42 a	1.59 a	0.75 a	0.87 a	0.88 a	0.12 b	0.40 a	0.11 b	0.21 a	
Coating*	0 b	0 b	0 c	0 c	0.01 b	0 b	0.02 b	0.01 c	0 c	
Coating* + hexanal	1.62 a	1.22 a	0.42 b	0.27 b	0.52 a	0.54 a	0.49 a	0.23 a	0.07 b	
C.V. (%)	57.37	55.60	47.51	66.05	79.65	75.96	66.63	65.51	41.83	

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different

Comparison

Appendix Table 23 Colony forming unit (log CFU g⁻¹) of longan fruit pericarp cv. Daw stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**				
	0	6	12	18	24
Control	4.87 a	4.43 ab	5.63 a	6.18 a	5.85 a
Hexanal	3.45 b	5.11 a	5.29 a	5.78 a	0 b
Coating*	5.02 a	4.86 a	5.00 a	5.70 a	4.76 a
Coating* + hexanal	2.85 c	3.70 b	3.31 b	3.55 b	0 b
C.V. (%)	6.25	14.38	14.38	10.84	7.46

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different

Comparison

Appendix Table 24 Colony forming unit (log CFU g⁻¹) of longan fruit aril cv. Daw stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**				
	0	6	12	18	24
Control	4.63 ab	3.26 a	4.05 a	6.12 a	4.05 a
Hexanal	3.25 b	3.41 a	4.54 a	5.88 a	0 b
Coating*	3.52 b	3.31 a	4.77 a	5.66 a	4.00 a
Coating* + hexanal	5.04 a	3.31 a	3.92 a	4.29 b	0 b
C.V. (%)	19.39	9.48	26.29	6.62	11.69

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison

Appendix Table 25 Outer peel acceptance score of longan fruit cv. Daw stored at 5°C after hexanal fumigation at 900 $\mu\text{l l}^{-1}$ for 2 h at ambient temperature. (1 = mostly dislike, 2 = moderately dislike, 3 = neither like nor dislike, 4 = moderately like, and 5 = mostly like).

Treatment	Days of storage at 5 °C**				
	5	10	15	20	24
Control	3.5 a	2.6 a	2.3 a	2.0 a	2.0 a
Hexanal	2.3 c	1.2 c	1.1 c	1.0 b	1.3 b
Coating*	3.0 b	2.0 b	1.9 b	1.9 a	1.6 ab
Coating* + hexanal	2.0 c	1.1 c	1.1 c	1.3 b	1.4 b
C.V. (%)	7.36	18.13	13.68	17.23	15.56

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different

Comparison

Appendix Table 26 Inner peel acceptance score of longan fruit cv. Daw stored at 5°C after hexanal fumigation at 900 $\mu\text{l l}^{-1}$ for 2 h at ambient temperature. (1 = mostly dislike, 2 = moderately dislike, 3 = neither like nor dislike, 4 = moderately like, and 5 = mostly like).

Treatment	Days of storage at 5 °C**				
	5	10	15	20	24
Control	3.7 a	2.9 a	2.5 a	2.8 a	2.2 a
Hexanal	1.8 b	1.1 b	1.1 b	1.0 c	1.1 b
Coating*	3.5 a	2.5 a	2.1 a	2.4 b	1.6 a
Coating* + hexanal	1.9 b	1.1 b	1.1 b	1.1 c	1.0 b
C.V. (%)	19.87	14.30	19.63	5.33	21.97

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different

Comparison

Appendix Table 27 Aril acceptance score of longan fruit cv. Daw stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature. (1 = mostly dislike, 2 = moderately dislike, 3 = neither like nor dislike, 4 = moderately like, and 5 = mostly like).

Treatment	Days of storage at 5 °C**				
	5	10	15	20	24
Control	3.9 a	2.9 a	2.6 a	2.5 a	2.4 a
Hexanal	3.6 b	2.4 b	2.1 a	1.8 b	2.0 ab
Coating*	3.8 ab	2.8 ab	2.4 a	2.4 a	2.1 ab
Coating* + hexanal	3.4 b	2.5 ab	2.0 a	2.2 ab	1.8 b
C.V. (%)	6.62	12.07	17.78	10.45	12.39

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different

Comparison

Appendix Table 28 Aroma acceptance score of longan fruit cv. Daw stored at 5°C after hexanal fumigation at 900 $\mu\text{l l}^{-1}$ for 2 h at ambient temperature. (1 = mostly dislike, 2 = moderately dislike, 3 = neither like nor dislike, 4 = moderately like, and 5 = mostly like).

Treatment	Days of storage at 5 °C**				
	5	10	15	20	24
Control	3.5 a	3.0 a	2.5 a	2.6 a	1.8 a
Hexanal	2.3 b	1.2 b	1.2 b	1.1 b	1.1 a
Coating*	3.2 a	2.9 a	2.2 a	2.3 a	1.4 a
Coating* + hexanal	2.1 b	1.4 b	1.4 b	1.3 b	1.2 a
C.V. (%)	12.73	14.59	11.88	10.68	20.21

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different

Comparison

Appendix Table 29 Flavour acceptance score of longan fruit cv. Daw stored at 5°C after hexanal fumigation at 900 $\mu\text{l l}^{-1}$ for 2 h at ambient temperature. (1 = mostly dislike, 2 = moderately dislike, 3 = neither like nor dislike, 4 = moderately like, and 5 = mostly like).

Treatment	Days of storage at 5 °C**				
	5	10	15	20	24
Control	3.4 a	2.6 a	2.3 a	2.4 a	1.8 a
Hexanal	1.6 c	1.3 b	1.2 b	1.1 b	1.1 b
Coating*	2.7 b	2.6 a	2.1 a	2.0 a	1.2 b
Coating* + hexanal	1.5 c	1.6 b	1.5 b	1.2 b	1.1 b
C.V. (%)	13.72	13.55	17.63	14.08	14.46

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison

Appendix Table 30 Overall acceptance score of longan fruit cv. Daw stored at 5°C after hexanal fumigation at 900 $\mu\text{l l}^{-1}$ for 2 h at ambient temperature. (1 = mostly dislike, 2 = moderately dislike, 3 = neither like nor dislike, 4 = moderately like, and 5 = mostly like).

Treatment	Days of storage at 5 °C**				
	5	10	15	20	24
Control	3.5 a	2.8 a	2.3 a	2.3 a	2.0 a
Hexanal	2.1 b	1.3 b	1.1 b	1.1 b	1.0 b
Coating*	2.9 b	2.6 a	2.1 a	2.1 a	1.2 b
Coating* + hexanal	1.8 c	1.5 b	1.3 b	1.1 b	1.0 b
C.V. (%)	10.15	11.98	12.26	9.68	12.08

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different

Comparison

Appendix Table 31 Longan fruit cv. Daw with fungi on the pericarp (%) stored at 5°C after hexanal fumigation at 900 $\mu\text{l l}^{-1}$ for 2 h at ambient temperature.

Treatment	Days of storage at 5 °C**									
	3	6	9	12	15	18	21	24		
Control	0	0	0	0	0	0	7.5 a	57.0 a		
Hexanal	0	0	0	0	0	0	5.0 a	0.0 c		
Coating*	0	0	0	0	0	0	7.5 a	37.0 b		
Coating* + hexanal	0	0	0	0	0	0	0.0 a	0.0 c		
C.V. (%)							147.2	41.22		

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Difference Comparison.

Appendix Table 32 Fungi score on longan fruit cv. Daw with fungi on the pericarp (%) stored at 5°C after hexanal fumigation at 90 µl l⁻¹ for 2 h at ambient temperature. (0 = no visual evidence, 1 = less than 10% of the surface, 2 = 10-30% of the surface, 3 = 30-70% of the surface, and 4 = more than 70% of the surface).

Treatment	Days of storage at 5 °C**									
	3	6	9	12	15	18	21	24		
Control	0	0	0	0	0	0	0.1 a	0.7 a		
Hexanal	0	0	0	0	0	0	0.0 a	0.0 c		
Coating*	0	0	0	0	0	0	0.1 a	0.4 b		
Coating* + hexanal	0	0	0	0	0	0	0.0 a	0.0 c		
C.V. (%)							5.21	9.00		

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Difference Comparison.

Appendix Table 33 Phytotoxicity score on longan fruit cv. Daw with fungi on the pericarp (%) stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature. (1 = no visual evidence, 2 = less than 10% of the surface, 3 = 10-30% of the surface, 4 = 30-70% of the surface, and 5 = more than 70% of the surface).

Treatment	Days of storage at 5 °C**									
	3	6	9	12	15	18	21	24		
Control	0.3 b	1.4 a	0.5 b	0.9 b	1.5 b	2.4 b	2.3 b	2.1 a		
Hexanal	2.2 a	1.7 a	2.9 a	2.2 a	2.6 a	2.8 a	2.4 ab	2.1 a		
Coating*	0.0 b	0.9 a	0.6 b	1.3 b	2.5 a	2.7 ab	3.0 a	2.4 a		
Coating* + hexanal	2.3 a	1.5 a	2.5 a	2.2 a	2.6 a	2.5 ab	2.6 ab	2.3 a		
C.V. (%)	13.13	49.63	23.84	11.60	15.42	7.31	11.02	9.85		

* = coating with sta-fresh 5% for 1 min

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Difference Comparison.

Appendix Table 34 Phenolic compound (mg gallic acid g fresh weight⁻¹) of longan pericarp cv. Daw from non-inoculated and *L. theobromae* inoculated fruit stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature

Treatment	Days of storage at 5 °C**										
	0	3	6	9	12	15	18	21	24	27	
noninoc-hexanal	5.80	5.67 a	7.15 a	6.13 a	5.14 a	5.19 a	4.76 a	4.91 a	4.79 a	5.52 a	
noninoc+hexanal	5.80	4.22 b	4.55 c	4.16 c	3.12 b	3.25 c	3.18 b	3.60 b	3.35 bc	3.58 b	
inoc-hexanal	6.71	5.30 a	5.41 b	5.45 b	4.95 a	4.25 b	4.85 a	4.52 a	4.24 ab	4.03 b	
inoc+hexanal	6.71	4.09 b	5.00 bc	3.79 c	3.24 b	3.09 c	2.93 c	3.78 b	2.59 c	3.43 b	
C.V. (%)		11.16	14.87	17.11	28.52	20.53	13	14.22	14.98	15.93	

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Difference Comparison.

Appendix Table 35 Specific polyphenoloxidase activity (unit mg protein⁻¹ min⁻¹) of longan pericarp cv. Daw from non-inoculated and *L. theobromae* inoculated fruit stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature

Treatment	Days of storage at 5 °C**											
	0	3	6	9	12	15	18	21	24	27		
noninoc-hexanal	1,221	372 c	1,024 b	844 b	760 b	977 b	837 c	804 b	599 b	561 b		
noninoc+hexanal	1,221	1,276 a	1,197 b	1,231a	1,204 ab	1,639 a	1,170 b	1,751a	894 a	1,190 a		
inoc-hexanal	1,150	659 b	1,060 b	688 b	784 b	937 b	751 c	950 b	496 b	650 b		
inoc+hexanal	1,150	1,361a	1,643 a	1,218 a	1,503 a	2,067 a	1,659 a	1,830 a	989 a	1,389 a		
C.V. (%)	11.16	14.87	17.11	28.52	20.53	13.00	14.22	14.98	15.93			

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison.

Appendix Table 36 Specific peroxidase activity (unit mg protein⁻¹ min⁻¹) of longan pericarp cv. Daw from non-inoculated and *L.theobromae* inoculated fruit stored at 5°C after hexanal fumigation at 900 µl l⁻¹ for 2 h at ambient temperature

Treatment	Days of storage at 5 °C**												
	0	3	6	9	12	15	18	21	24	27			
noninoc-hexanal	32,223	19,168 c	25,597 c	55,993 b	60,565 c	40,728 c	71,558 b	45,424 c	88,158 c	67,879 b			
noninoc+hexanal	32,223	67,038 b	71,073 b	110,652 a	143,520 a	105,891 b	109,803 a	110,328 a	167,037 a	105,164 a			
inoc-hexanal	47,112	24,965 c	22,827 c	49,984 b	78,118 b	59,918 c	103,166 ab	89,222 b	127,239 b	90,091 ab			
inoc+hexanal	47,112	107,380 a	95,307 a	130,067 a	152,231 a	158,600 a	118,733 a	104,730 a	163,273 a	96,050 a			
C.V. (%)		29.02	22.62	19.84	7.64	29.50	17.47	8.55	10.91	14.60			

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison.

Appendix Table 37 Absorbance at 575 nm per mg protein of polygalacturonase of longan pericarp cv. Daw from non-inoculated and *L. theobromae* inoculated fruit stored at 5°C after hexanal fumigation at 900 $\mu\text{l l}^{-1}$ for 2 h at ambient temperature

Treatment	Days of storage at 5 °C**										
	0	3	6	9	12	15	18	21	24	27	
nonioc-hexanal	9.04	10.20 b	7.53 b	8.51 b	8.00 b	10.02 b	8.21 c	12.26 c	19.03 b	24.30 b	
nonioc+hexanal	9.04	21.05 a	15.89 a	28.95 a	21.73 a	30.32 a	27.48 a	33.92 a	65.87 a	83.01 a	
inoc-hexanal	7.76	11.50 b	8.03 b	10.27 b	9.15 b	15.01 b	15.35 b	18.81 bc	32.59 b	37.15 b	
inoc+hexanal	7.76	23.68 a	18.23 a	27.18 a	25.41 a	28.08 a	26.59 a	46.60 a	70.76 a	78.99 a	
C.V. (%)		34.11	19.27	21.14	31.3	22.31	20.84	38.71	21.78	43.65	

** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison.

Appendix Table 38 Absorbance at 575 nm per mg protein of cellulase of longan pericarp cv. Daw from non-inoculated and *L. theobromae* inoculated fruit stored at 5°C after hexanal fumigation at 900 $\mu\text{l l}^{-1}$ for 2 h at ambient temperature

Treatment	Days of storage at 5 °C**										
	0	3	6	9	12	15	18	21	24	27	
nonioc-hexanal	5.85	7.30 b	6.54 b	7.27 b	8.56 b	7.80 b	7.55 b	9.17 b	13.68 c	17.94 b	
nonioc+hexanal	5.85	15.80 a	12.76 a	24.69 a	27.21 a	25.31 a	28.08 a	29.38 a	49.75 b	77.16 a	
inoc-hexanal	6.11	7.53 b	6.99 b	8.37 b	8.45 b	11.64 b	11.65 b	14.25 b	21.94 c	28.21 b	
inoc+hexanal	6.11	18.13 a	15.00 a	21.84 a	26.62 a	28.03 a	25.29 a	39.15 a	65.71 a	69.77 a	
C.V. (%)		31.06	15.09	21.83	32.07	19.36	29.36	37.15	26.84	48.54	

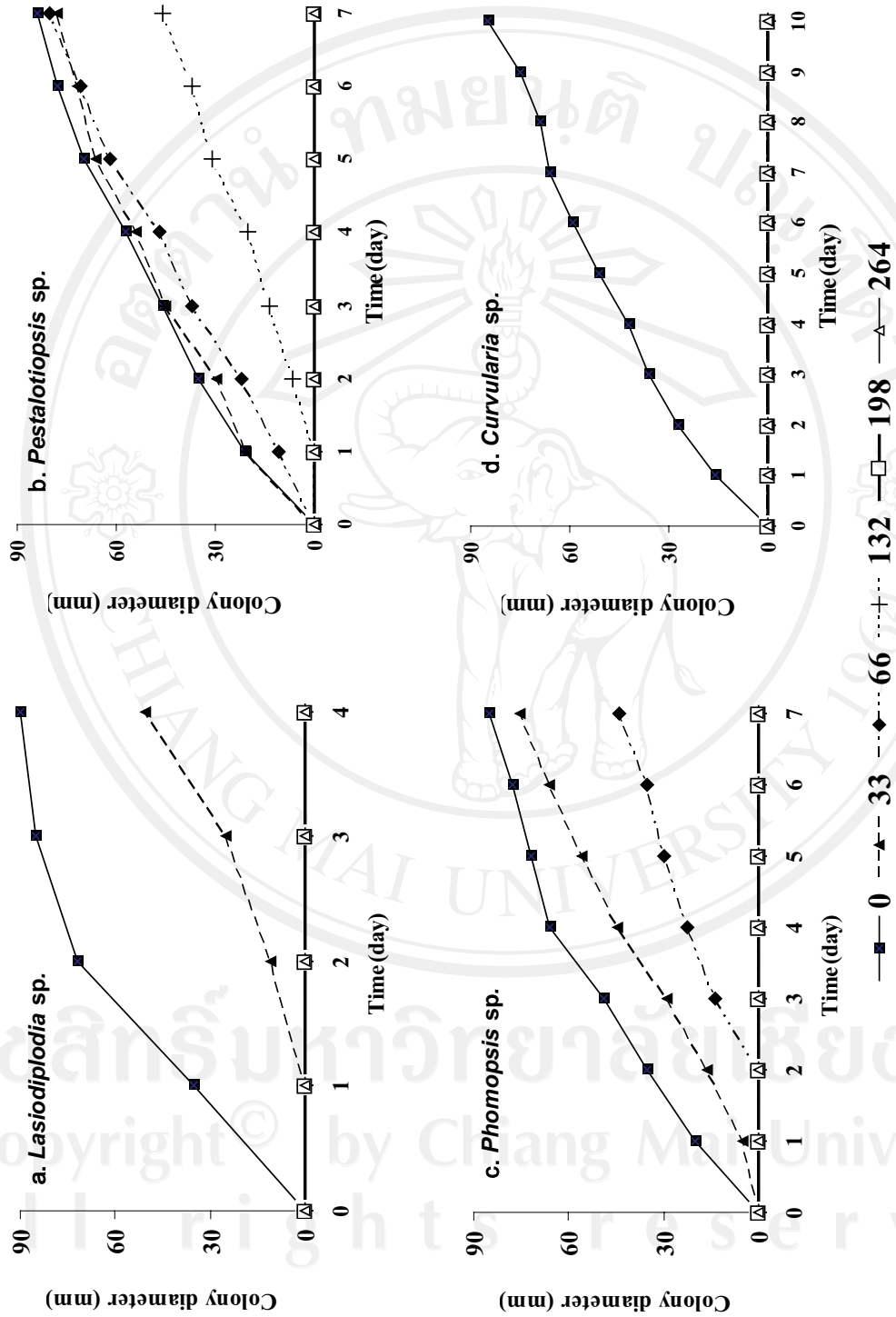
** = means within the same column followed by different letters are significantly at 95 % ($P \leq 0.05$) level by Least Significant Different Comparison.



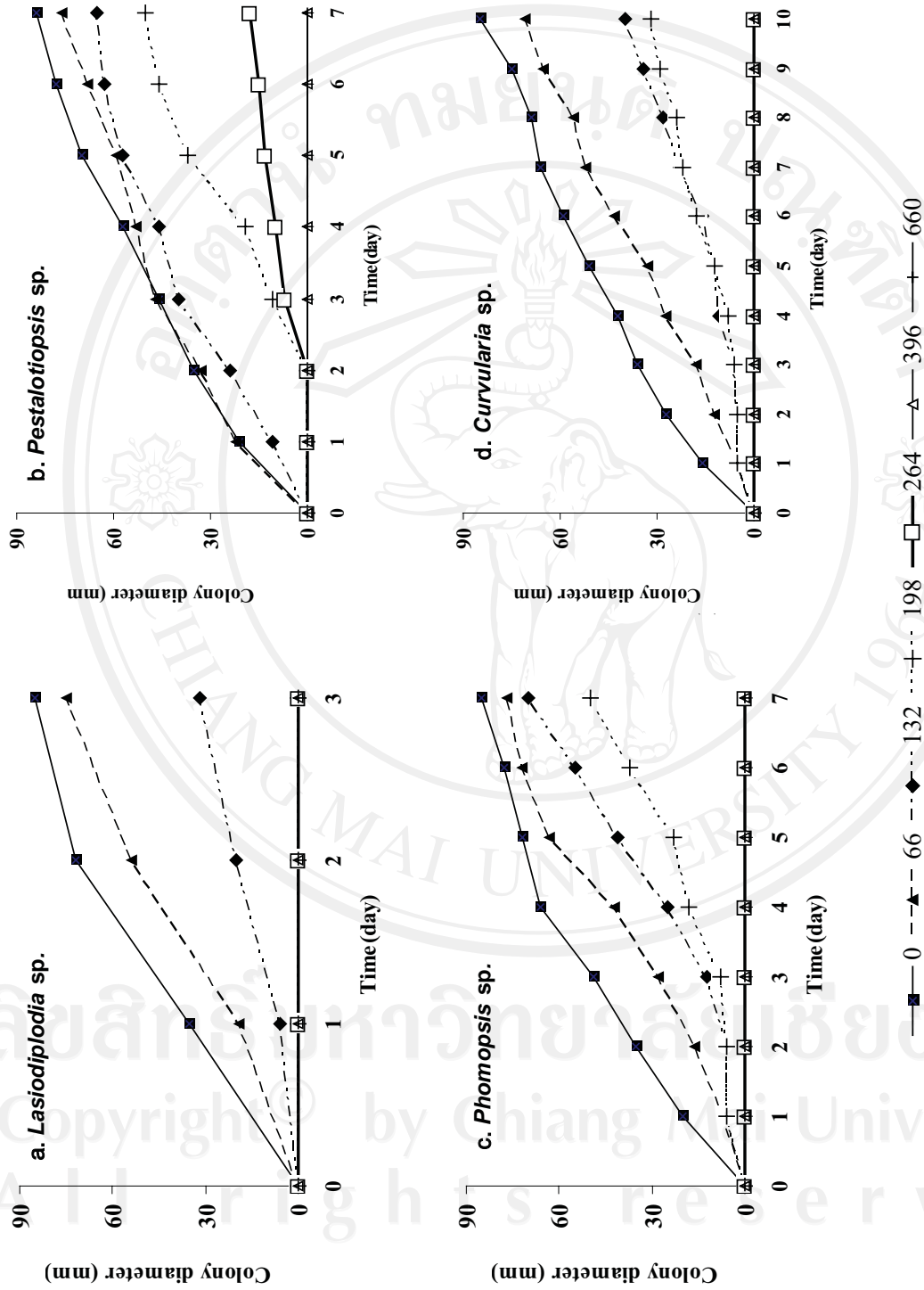
APPENDIX B

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่

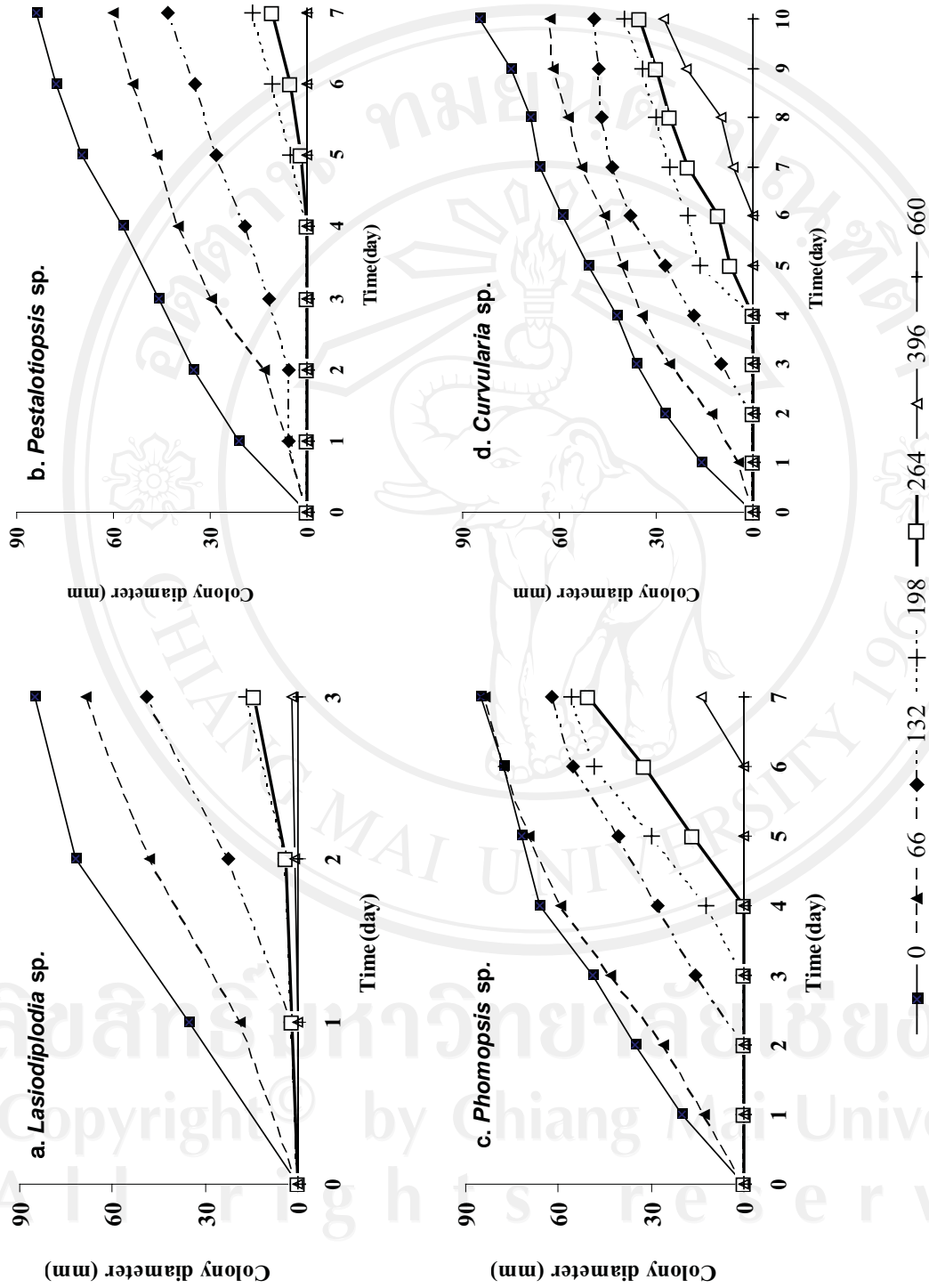
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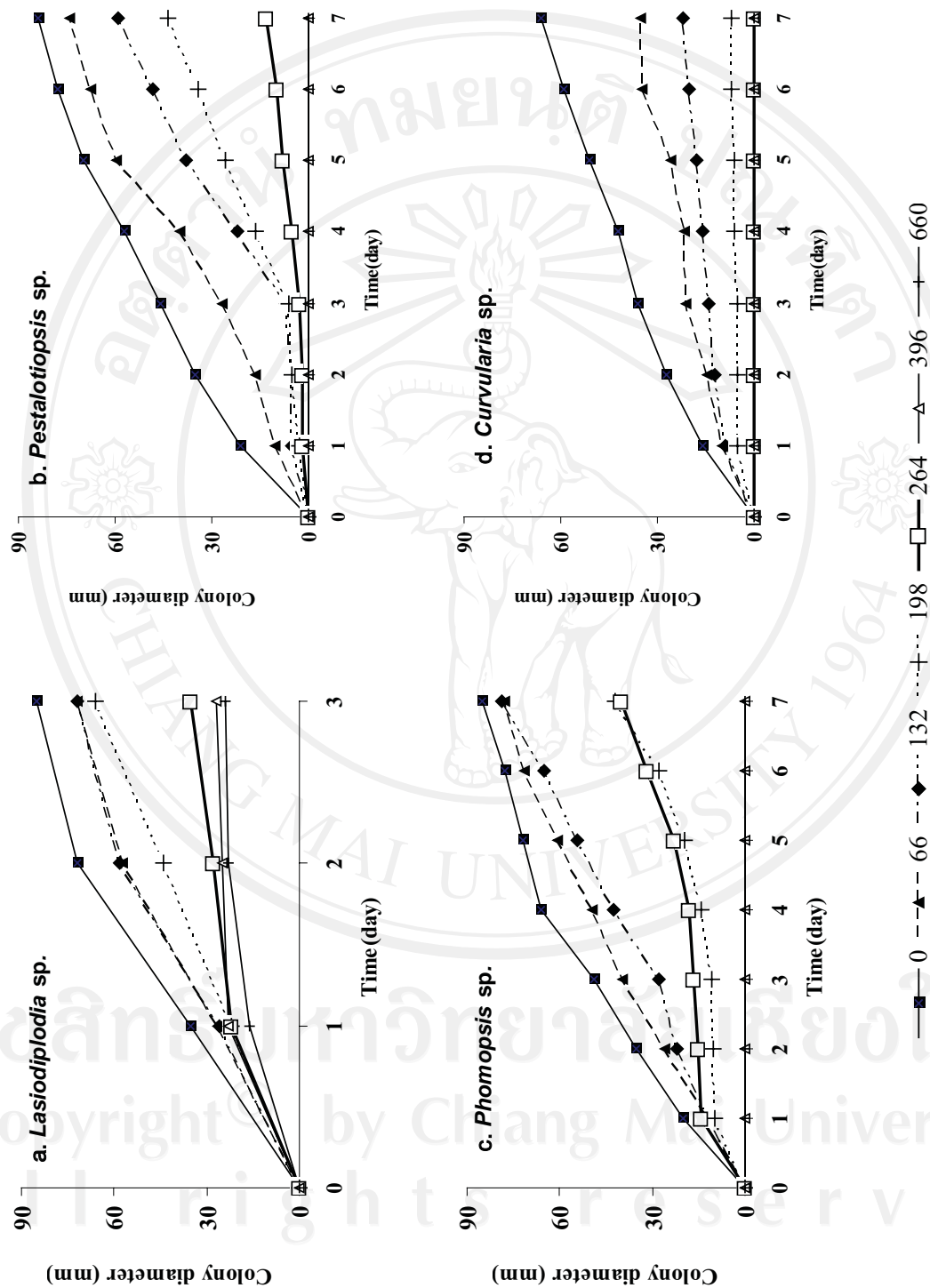
Appendix Figure 1 Colony diameter (mm) of four longan fruit decay fungi fumigated with *trans*-2 hexanal at 0, 33, 66, 132, 198 and 264 $\mu\text{l l}^{-1}$ *in vitro*



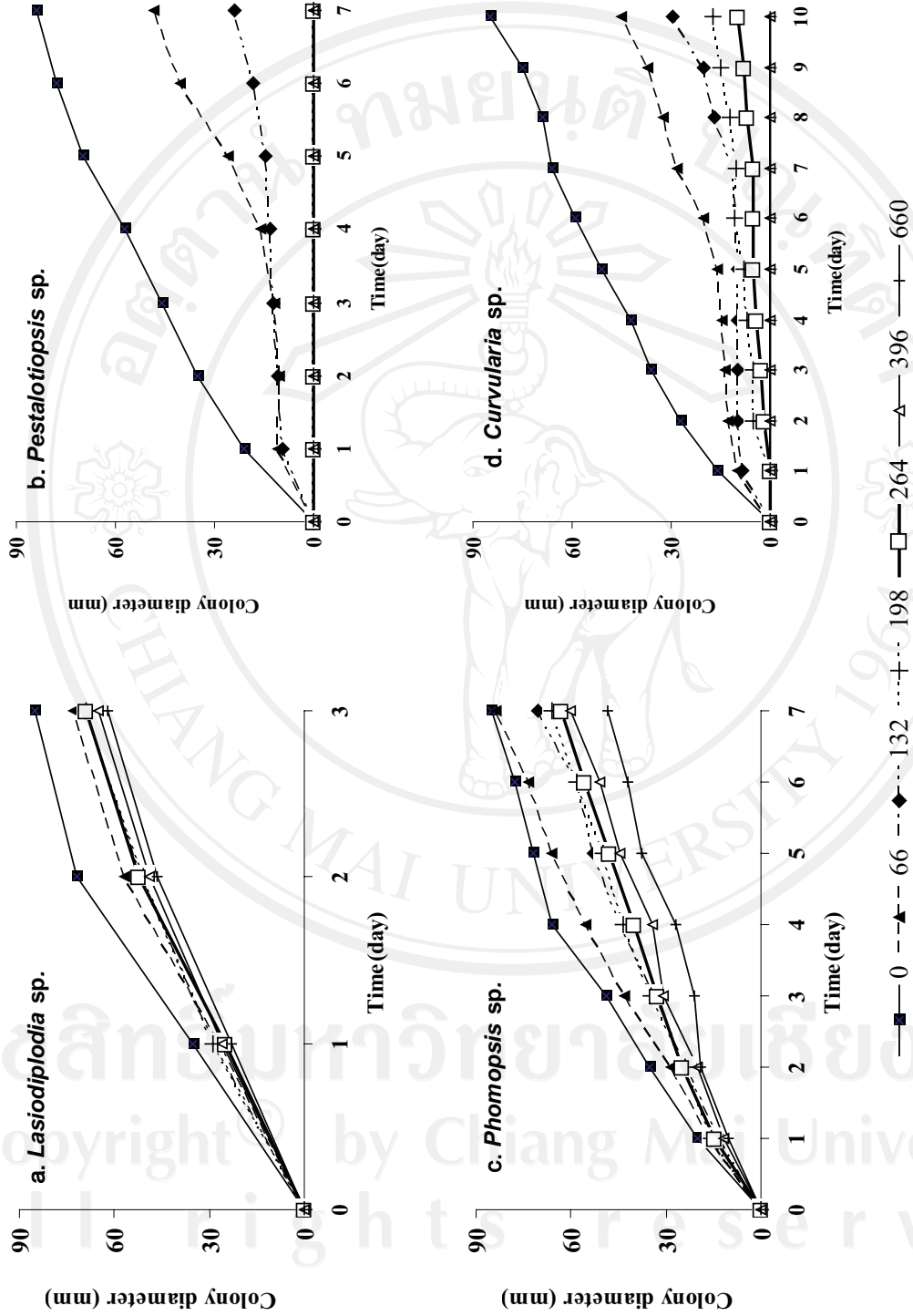
Appendix Figure 2 Colony diameter (mm) of four longan fruit decay fungi fumigated with hexanal at 0, 66, 132, 198, 264, 396 and 660 $\mu\text{l l}^{-1}$ *in vitro*.



Appendix Figure 3 Colony diameter (mm) of four longan fruit decay fungi fumigated with 2-nonanone at 0, 66, 132, 198, 264, 396 and 660 $\mu\text{l l}^{-1}$ *in vitro*.



Appendix Figure 4 Colony diameter (mm) of four longan fruit decay fungi fumigated with methyl benzoate at 0, 66, 132, 198, 264, 396 and 660 $\mu\text{l l}^{-1}$ *in vitro*.



Appendix Figure 5 Colony diameter (mm) of four longan fruit decay fungi fumigated with methyl salicylate at 0, 66, 132, 198, 264, 396 and 660 $\mu\text{l l}^{-1}$ *in vitro*.

CURRICULUM VITAE

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