



**APPENDIX**

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่

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**Table A.1** Weight loss (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at room temperature (23±3°C) and 56±5% relative humidity for 13 days

Treatments	Storage time (days)					
	0	1	4	7	10	13
Citraghine	0.00±0.00	0.59±0.05 <sup>efg</sup>	2.03±0.20 <sup>ef</sup>	3.41±0.35 <sup>ef</sup>	4.66±.46 <sup>fg</sup>	5.51±0.55 <sup>ef</sup>
Sealkote	0.00±0.00	0.51±0.01 <sup>fg</sup>	1.80±0.10 <sup>ef</sup>	3.11±0.20 <sup>ef</sup>	4.40±0.26 <sup>fg</sup>	5.26±0.33 <sup>ef</sup>
Fomesa	0.00±0.00	0.47±0.07 <sup>b</sup>	1.69±0.28 <sup>f</sup>	2.91±0.50 <sup>f</sup>	4.04±0.66 <sup>b</sup>	4.84±0.78 <sup>f</sup>
Rosy Plus	0.00±0.00	0.79±0.14 <sup>bc</sup>	2.79±0.50 <sup>bc</sup>	4.76±0.82 <sup>bc</sup>	6.49±1.14 <sup>cd</sup>	7.71±1.37 <sup>c</sup>
Citrosol AK	0.00±0.00	0.81±0.10 <sup>bc</sup>	2.74±0.37 <sup>bc</sup>	4.75±0.59 <sup>bc</sup>	6.56±0.99 <sup>bcd</sup>	7.94±1.22 <sup>bc</sup>
Supershine-C	0.00±0.00	0.64±0.04 <sup>def</sup>	2.24±0.13 <sup>d</sup>	3.73±0.21 <sup>de</sup>	5.17±0.28 <sup>ef</sup>	6.21±0.37 <sup>de</sup>
Zivdar	0.00±0.00	0.69±0.08 <sup>cde</sup>	2.55±0.29 <sup>cd</sup>	4.41±0.54 <sup>cd</sup>	6.21±0.77 <sup>de</sup>	7.47±0.94 <sup>cd</sup>
Perfect Shine	0.00±0.00	0.89±0.08 <sup>ab</sup>	3.00±0.21 <sup>b</sup>	4.92±0.33 <sup>bc</sup>	6.70±0.41 <sup>bcd</sup>	7.87±0.48 <sup>bc</sup>
Wax (unknown)	0.00±0.00	0.56±0.06 <sup>efg</sup>	1.99±0.23 <sup>ef</sup>	3.37±0.37 <sup>ef</sup>	4.84±0.49 <sup>fg</sup>	5.80±0.57 <sup>ef</sup>
PE microemulsion	0.00±0.00	0.62±0.04 <sup>ef</sup>	2.22±0.15 <sup>de</sup>	3.84±0.25 <sup>de</sup>	5.36±0.36 <sup>ef</sup>	6.39±0.44 <sup>de</sup>
1.5% chitosan	0.00±0.00	0.87±0.13 <sup>ab</sup>	3.05±0.42 <sup>b</sup>	5.31±0.74 <sup>b</sup>	7.62±0.95 <sup>b</sup>	9.12±1.14 <sup>b</sup>
2.0% chitosan	0.00±0.00	0.78±0.17 <sup>bcd</sup>	2.93±0.46 <sup>bc</sup>	5.20±0.83 <sup>b</sup>	7.50±1.17 <sup>bc</sup>	9.05±1.45 <sup>b</sup>
non-coated	0.00±0.00	0.97±0.12 <sup>a</sup>	3.63±0.32 <sup>a</sup>	6.47±0.57 <sup>a</sup>	9.28±0.84 <sup>a</sup>	11.17±0.99 <sup>a</sup>
LSD <sub>0.05</sub>	-	0.14	0.44	0.77	1.09	1.33
C.V. (%)	-	13.56	12.25	12.28	12.22	12.36

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.2** Internal O<sub>2</sub> (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at room temperature (23±3°C) and 56±5% relative humidity for 13 days

Treatments	Storage time (days)					
	0	1	4	7	10	13
Citrahine	17.17±1.09	1.35±0.25 <sup>d</sup>	1.50±0.26 <sup>d</sup>	2.18±1.29 <sup>cde</sup>	1.12±0.32 <sup>f</sup>	1.84±0.29 <sup>d</sup>
Sealkote	17.17±1.09	2.38±0.85 <sup>cd</sup>	5.61±4.60 <sup>bc</sup>	2.91±0.91 <sup>cde</sup>	4.76±2.74 <sup>cde</sup>	2.93±0.95 <sup>cd</sup>
Fomesa	17.17±1.09	3.32±0.51 <sup>cd</sup>	2.16±0.92 <sup>cd</sup>	1.63±0.29 <sup>de</sup>	1.45±0.55 <sup>ef</sup>	2.19±0.57 <sup>cd</sup>
Rosy Plus	17.17±1.09	2.23±0.92 <sup>cd</sup>	2.14±0.65 <sup>cd</sup>	2.14±1.32 <sup>cde</sup>	3.52±1.42 <sup>cdef</sup>	4.34±1.66 <sup>c</sup>
Citrosol AK	17.17±1.09	1.66±0.36 <sup>d</sup>	1.41±0.27 <sup>d</sup>	1.51±0.31 <sup>e</sup>	3.21±1.99 <sup>cdef</sup>	1.95±0.58 <sup>cd</sup>
Supershine-C	17.17±1.09	4.56±7.03 <sup>bcd</sup>	1.33±0.30 <sup>d</sup>	2.16±0.62 <sup>cde</sup>	1.73±0.40 <sup>ef</sup>	3.50±1.64 <sup>cd</sup>
Zivdar	17.17±1.09	7.78±2.57 <sup>b</sup>	6.84±1.34 <sup>b</sup>	8.26±1.67 <sup>b</sup>	8.91±3.78 <sup>b</sup>	8.99±1.01 <sup>b</sup>
Perfect Shine	17.17±1.09	2.84±1.25 <sup>cd</sup>	2.79±0.75 <sup>cd</sup>	3.04±1.18 <sup>cd</sup>	3.02±1.42 <sup>def</sup>	3.35±1.37 <sup>cd</sup>
Wax (unknown)	17.17±1.09	3.19±0.90 <sup>cd</sup>	3.74±0.40 <sup>c</sup>	2.44±1.72 <sup>cde</sup>	6.08±2.89 <sup>bcd</sup>	3.37±1.03 <sup>cd</sup>
PE microemulsion	17.17±1.09	3.20±0.89 <sup>cd</sup>	1.83±0.59 <sup>cd</sup>	3.42±0.76 <sup>c</sup>	6.74±2.27 <sup>bc</sup>	4.13±0.73 <sup>cd</sup>
1.5% chitosan	17.17±1.09	4.99±0.91 <sup>bc</sup>	6.45±2.11 <sup>b</sup>	5.72±1.36 <sup>b</sup>	4.66±1.57 <sup>cdef</sup>	2.23±0.88 <sup>cd</sup>
2.0% chitosan	17.17±1.09	2.01±0.70 <sup>cd</sup>	2.57±1.51 <sup>cd</sup>	2.96±1.14 <sup>cde</sup>	4.34±1.62 <sup>cdef</sup>	4.10±1.65 <sup>cd</sup>
non-coated	17.17±1.09	17.07±0.51 <sup>a</sup>	18.50±0.72 <sup>a</sup>	17.67±0.63 <sup>a</sup>	18.56±0.49 <sup>a</sup>	18.94±0.46 <sup>a</sup>
LSD <sub>0.05</sub>	1.56	3.27	2.21	1.52	3.55	3.33
C.V. (%)	6.39	35.91	37.45	26.44	33.16	37.99

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.3** Internal CO<sub>2</sub> (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at room temperature (23±3°C) and 56±5% relative humidity for 13 days

Treatments	Storage time (days)					
	0	1	4	7	10	13
Citrahshine	2.30±0.67	11.10±1.49 <sup>ab</sup>	13.98±6.51 <sup>ab</sup>	12.13±2.35 <sup>bc</sup>	9.00±2.79 <sup>cd</sup>	16.80±3.87 <sup>abcd</sup>
Sealkote	2.30±0.67	6.00±2.26 <sup>f</sup>	4.50±0.88 <sup>e</sup>	6.22±1.71 <sup>e</sup>	5.53±1.04 <sup>d</sup>	13.48±3.44 <sup>cde</sup>
Fomesa	2.30±0.67	10.35±1.82 <sup>abcd</sup>	12.84±4.41 <sup>abc</sup>	14.23±4.48 <sup>ab</sup>	16.96±7.54 <sup>ab</sup>	18.52±4.67 <sup>abc</sup>
Rosy Plus	2.30±0.67	7.73±1.93 <sup>cdef</sup>	7.73±1.66 <sup>bcd</sup>	12.21±3.00 <sup>bc</sup>	11.80±2.53 <sup>bcd</sup>	13.02±3.38 <sup>cde</sup>
Citrosol AK	2.30±0.67	11.00±4.35 <sup>abc</sup>	14.14±4.03 <sup>a</sup>	18.17±7.78 <sup>a</sup>	18.15±4.56 <sup>a</sup>	19.78±3.41 <sup>a</sup>
Supershine-C	2.30±0.67	12.87±3.07 <sup>a</sup>	11.95±2.67 <sup>abcd</sup>	10.63±2.67 <sup>bcd</sup>	11.07±2.69 <sup>bcd</sup>	13.12±2.98 <sup>cde</sup>
Zivdar	2.30±0.67	7.39±1.28 <sup>def</sup>	6.14±1.20 <sup>de</sup>	7.36±0.63 <sup>de</sup>	7.22±1.18 <sup>cd</sup>	7.46±1.28 <sup>ef</sup>
Perfect Shine	2.30±0.67	6.00±0.42 <sup>f</sup>	5.23±1.14 <sup>e</sup>	6.34±1.63 <sup>e</sup>	6.04±0.80 <sup>d</sup>	10.87±4.67 <sup>def</sup>
Wax (unknown)	2.30±0.67	8.87±2.65 <sup>bcd</sup>	7.34±2.29 <sup>cde</sup>	11.32±3.49 <sup>bcd</sup>	8.99±2.07 <sup>cd</sup>	13.57±1.98 <sup>cde</sup>
PE microemulsion	2.30±0.67	9.44±3.81 <sup>bcd</sup>	4.68±1.18 <sup>e</sup>	7.10±0.61 <sup>de</sup>	5.67±0.76 <sup>d</sup>	10.80±1.49 <sup>def</sup>
1.5% chitosan	2.30±0.67	6.78±0.78 <sup>ef</sup>	13.23±1.82 <sup>abc</sup>	11.14±3.53 <sup>bcd</sup>	13.09±2.00 <sup>abc</sup>	14.94±1.07 <sup>bcd</sup>
2.0% chitosan	2.30±0.67	10.83±3.78 <sup>abc</sup>	16.38±4.67 <sup>a</sup>	13.46±1.93 <sup>abc</sup>	17.96±1.32 <sup>ab</sup>	19.03±3.87 <sup>abc</sup>
non-coated	2.30±0.67	2.57±0.58 <sup>g</sup>	2.60±0.78 <sup>e</sup>	2.91±0.60 <sup>f</sup>	2.65±0.51 <sup>e</sup>	2.81±0.57 <sup>f</sup>
LSD <sub>0.05</sub>	3.82	3.35	6.26	4.77	6.41	6.71
C.V. (%)	36.65	29.30	32.18	31.28	31.75	34.13

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.4** Respiration rate (mg CO<sub>2</sub>/kg/hr) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at room temperature (23±3°C) and 56±5% relative humidity for 13 days

Treatments	Storage time (days)					
	0	1	4	7	10	13
Citriashine	11.43±0.61 <sup>de</sup>	12.66±0.45 <sup>d</sup>	13.03±0.83 <sup>ef</sup>	18.34±0.34 <sup>c</sup>	26.13±1.03 <sup>b</sup>	27.45±0.17 <sup>bc</sup>
Sealkote	9.76±0.57 <sup>f</sup>	11.09±0.16 <sup>e</sup>	12.95±1.56 <sup>ef</sup>	17.09±0.17 <sup>cd</sup>	22.85±1.45 <sup>bc</sup>	23.66±2.38 <sup>c</sup>
Fomesa	8.99±0.56 <sup>fg</sup>	10.42±0.42 <sup>ef</sup>	10.39±0.16 <sup>h</sup>	15.05±2.44 <sup>d</sup>	21.92±2.35 <sup>bc</sup>	23.67±3.30 <sup>c</sup>
Rosy Plus	7.73±0.40 <sup>g</sup>	8.73±0.19 <sup>f</sup>	8.99±0.23 <sup>i</sup>	9.56±0.47 <sup>e</sup>	13.72±0.11 <sup>d</sup>	12.51±0.72 <sup>d</sup>
Citrosol AK	11.22±0.51 <sup>e</sup>	12.62±0.35 <sup>d</sup>	13.19±0.20 <sup>e</sup>	18.13±0.18 <sup>c</sup>	24.59±5.07 <sup>bc</sup>	26.53±2.43 <sup>bc</sup>
Supershine-C	9.29±0.03 <sup>f</sup>	9.96±0.54 <sup>f</sup>	8.41±0.50 <sup>i</sup>	8.73±0.16 <sup>f</sup>	8.93±0.39 <sup>d</sup>	9.03±0.38 <sup>f</sup>
Zivdar	12.86±0.25 <sup>cd</sup>	13.63±0.90 <sup>c</sup>	14.49±0.19 <sup>d</sup>	18.52±0.60 <sup>c</sup>	24.43±0.63 <sup>bc</sup>	25.73±0.43 <sup>bc</sup>
Perfect Shine	13.19±3.35 <sup>c</sup>	10.87±0.19 <sup>e</sup>	12.22±0.20 <sup>fg</sup>	16.50±0.26 <sup>cd</sup>	22.79±3.55 <sup>bc</sup>	23.90±1.90 <sup>c</sup>
Wax (unknown)	8.87±0.18 <sup>fg</sup>	8.91±0.41 <sup>g</sup>	12.64±0.57 <sup>efg</sup>	16.30±0.29 <sup>cd</sup>	23.56±2.41 <sup>bc</sup>	24.61±1.49 <sup>bc</sup>
PE microemulsion	10.20±0.30 <sup>ef</sup>	10.90±0.19 <sup>g</sup>	12.10±0.90 <sup>g</sup>	16.16±0.18 <sup>cd</sup>	21.07±3.19 <sup>c</sup>	24.57±2.32 <sup>c</sup>
1.5% chitosan	15.46±0.77 <sup>b</sup>	16.50±0.70 <sup>b</sup>	16.69±0.69 <sup>c</sup>	25.93±6.80 <sup>b</sup>	36.82±4.13 <sup>a</sup>	29.53±4.28 <sup>b</sup>
2.0% chitosan	19.62±0.28 <sup>a</sup>	16.85±0.26 <sup>b</sup>	17.82±0.25 <sup>b</sup>	19.11±0.94 <sup>c</sup>	19.79±1.61 <sup>c</sup>	20.45±1.15 <sup>e</sup>
non-coated	19.78±0.23 <sup>a</sup>	18.85±0.99 <sup>a</sup>	23.58±0.37 <sup>a</sup>	29.98±0.70 <sup>a</sup>	34.85±4.21 <sup>a</sup>	35.34±10.08 <sup>a</sup>
LSD <sub>0.05</sub>	1.46	0.65	0.82	2.92	4.75	4.95
C.V. (%)	8.38	3.63	4.23	12.36	14.92	15.26

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.5** Alcohol dehydrogenase activity (units/min/mg protein) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at room temperature ( $23\pm 3^\circ\text{C}$ ) and  $56\pm 5\%$  relative humidity for 13 days

Treatments	Storage time (days)					
	0	1	4	7	10	13
Citrashine	2.03±0.98	2.32±1.76 <sup>ab</sup>	14.81±7.80 <sup>ab</sup>	2.19±0.77 <sup>cd</sup>	10.76±9.19 <sup>a</sup>	1.40±0.61 <sup>b</sup>
Sealkote	2.03±0.98	2.44±0.69 <sup>ab</sup>	12.66±4.55 <sup>ab</sup>	2.41±1.30 <sup>cd</sup>	6.66±4.07 <sup>ab</sup>	3.35±1.97 <sup>ab</sup>
Fomesa	2.03±0.98	3.66±1.70 <sup>ab</sup>	22.21±9.39 <sup>ab</sup>	4.37±2.99 <sup>cd</sup>	1.83±0.50 <sup>bc</sup>	1.12±0.04 <sup>b</sup>
Rosy Plus	2.03±0.98	2.09±1.61 <sup>ab</sup>	32.28±13.09 <sup>a</sup>	5.19±2.46 <sup>cd</sup>	1.49±0.80 <sup>c</sup>	3.08±1.80 <sup>ab</sup>
Citrosol AK	2.03±0.98	2.16±0.55 <sup>ab</sup>	24.19±11.84 <sup>ab</sup>	1.26±0.09 <sup>d</sup>	1.72±0.61 <sup>c</sup>	1.32±0.58 <sup>b</sup>
Supershine-C	2.03±0.98	2.46±0.14 <sup>ab</sup>	18.23±12.63 <sup>ab</sup>	1.56±0.54 <sup>d</sup>	0.67±0.28 <sup>c</sup>	2.22±1.05 <sup>ab</sup>
Zivdar	2.03±0.98	1.61±0.54 <sup>b</sup>	35.28±30.76 <sup>a</sup>	19.81±12.89 <sup>b</sup>	1.50±0.53 <sup>c</sup>	2.16±1.18 <sup>ab</sup>
Perfect Shine	2.03±0.98	1.74±0.57 <sup>b</sup>	8.09±6.743 <sup>b</sup>	8.99±7.87 <sup>bcd</sup>	2.20±1.10 <sup>bc</sup>	6.24±4.69 <sup>a</sup>
Wax (unknown)	2.03±0.98	2.20±0.18 <sup>ab</sup>	19.26±7.63 <sup>ab</sup>	13.17±5.91 <sup>bc</sup>	1.07±0.66 <sup>c</sup>	2.60±2.40 <sup>ab</sup>
PE microemulsion	2.03±0.98	2.29±0.88 <sup>ab</sup>	1.42±0.71 <sup>b</sup>	2.39±0.39 <sup>cd</sup>	2.35±1.74 <sup>bc</sup>	1.49±0.60 <sup>b</sup>
1.5% chitosan	2.03±0.98	4.32±3.62 <sup>a</sup>	2.17±1.18 <sup>b</sup>	35.08±13.82 <sup>a</sup>	2.31±1.80 <sup>bc</sup>	1.28±0.45 <sup>b</sup>
2.0% chitosan	2.03±0.98	1.98±0.70 <sup>ab</sup>	2.12±1.52 <sup>b</sup>	35.48±5.21 <sup>a</sup>	1.21±0.53 <sup>c</sup>	3.56±2.68 <sup>ab</sup>
non-coated	2.03±0.98	2.48±1.77 <sup>ab</sup>	3.41±3.30 <sup>b</sup>	3.42±2.03 <sup>cd</sup>	1.08±0.25 <sup>c</sup>	1.62±0.29 <sup>ab</sup>
LSD <sub>0.05</sub>	1.64	2.44	22.88	11.02	4.91	4.65
C.V. (%)	48.14	59.57	61.28	63.02	49.82	64.43

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.6** Flavor score of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at room temperature (23±3°C) and 56±5% relative humidity for 13 days

Treatments	Storage time (days)					
	0	1	4	7	10	13
Citrahine	4.00±0.00	4.00±0.00	3.25±0.46 <sup>bc</sup>	3.38±0.92 <sup>abc</sup>	3.40±0.55 <sup>abc</sup>	2.57±0.53 <sup>ed</sup>
Sealkote	4.00±0.00	4.00±0.00	3.75±0.46 <sup>a</sup>	3.88±0.35 <sup>a</sup>	3.60±0.89 <sup>ab</sup>	2.57±0.53 <sup>cd</sup>
Fomesa	4.00±0.00	4.00±0.00	3.88±0.35 <sup>a</sup>	3.88±0.74 <sup>a</sup>	2.20±0.84 <sup>cd</sup>	2.14±1.07 <sup>de</sup>
Rosy Plus	4.00±0.00	4.00±0.00	3.88±0.35 <sup>a</sup>	3.13±0.64 <sup>bc</sup>	3.20±0.84 <sup>abc</sup>	2.71±0.49 <sup>cd</sup>
Citrosol AK	4.00±0.00	4.00±0.00	3.88±0.35 <sup>a</sup>	3.63±0.74 <sup>ab</sup>	1.60±0.55 <sup>d</sup>	2.00±0.00 <sup>e</sup>
Supershine-C	4.00±0.00	4.00±0.00	3.13±0.83 <sup>c</sup>	1.63±0.74 <sup>b</sup>	1.40±0.89 <sup>d</sup>	2.86±0.69 <sup>bc</sup>
Zivdar	4.00±0.00	4.00±0.00	3.88±0.35 <sup>a</sup>	3.88±0.35 <sup>a</sup>	3.80±0.45 <sup>a</sup>	3.43±0.53 <sup>ab</sup>
Perfect Shine	4.00±0.00	4.00±0.00	3.88±0.35 <sup>a</sup>	3.50±0.53 <sup>abc</sup>	3.00±0.71 <sup>bcd</sup>	2.71±0.49 <sup>cd</sup>
Wax (unknown)	4.00±0.00	4.00±0.00	3.13±0.64 <sup>c</sup>	2.25±0.71 <sup>efg</sup>	2.60±0.55 <sup>cd</sup>	1.71±0.76 <sup>e</sup>
PE microemulsion	4.00±0.00	4.00±0.00	3.63±0.52 <sup>ab</sup>	3.00±0.93 <sup>bcd</sup>	2.80±0.45 <sup>bed</sup>	3.29±0.76 <sup>abc</sup>
1.5% chitosan	4.00±0.00	4.00±0.00	3.88±0.35 <sup>a</sup>	3.25±0.71 <sup>abc</sup>	3.40±0.55 <sup>abc</sup>	2.71±0.49 <sup>cd</sup>
2.0% chitosan	4.00±0.00	4.00±0.00	3.75±0.46 <sup>a</sup>	3.50±0.76 <sup>abc</sup>	3.80±0.45 <sup>a</sup>	3.71±0.49 <sup>a</sup>
non-coated	4.00±0.00	4.00±0.00	3.88±0.35 <sup>a</sup>	3.88±0.64 <sup>a</sup>	3.80±0.45 <sup>a</sup>	3.80±0.53 <sup>a</sup>
LSD <sub>0.05</sub>	-	-	0.47	0.69	0.83	0.65
C.V. (%)	-	-	12.84	23.95	24.41	22.07

Means followed by different superscript letters within a column are significantly different (P≤0.05)

Evaluation of flavor by tasting, using a scale of 1 to 4 where 4 = excellent, 3 = slightly off-flavor, 2 = moderately off-flavor and 1 = extremely off-flavor. Fruit taste was rated "unacceptable" when the taste score was below three.

**Table A.7** Visual appearance score of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at room temperature ( $23\pm 3^{\circ}\text{C}$ ) and  $56\pm 5\%$  relative humidity for 13 days

Treatments	Storage time (days)					
	0	1	4	7	10	13
Citrahine	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	4.88±0.35 <sup>a</sup>	4.80±0.45 <sup>a</sup>	4.80±0.38 <sup>a</sup>
Sealkote	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	4.75±0.71 <sup>ab</sup>	4.60±0.55 <sup>a</sup>	4.43±0.79 <sup>ab</sup>
Fomesa	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	4.63±0.52 <sup>abc</sup>	4.60±0.45 <sup>a</sup>	4.57±0.79 <sup>ab</sup>
Rosy Plus	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	4.38±0.74 <sup>abcd</sup>	4.40±0.55 <sup>ab</sup>	3.71±0.95 <sup>bcd</sup>
Citrosol AK	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	4.63±0.52 <sup>abc</sup>	4.40±0.55 <sup>ab</sup>	4.14±0.90 <sup>abc</sup>
Supershine-C	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	4.00±0.76 <sup>cd</sup>	4.00±0.55 <sup>a</sup>	4.00±1.00 <sup>abc</sup>
Zivdar	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	4.00±0.53 <sup>cd</sup>	4.00±0.71 <sup>abc</sup>	3.43±0.98 <sup>cde</sup>
Perfect Shine	5.00±0.00	5.00±0.00	4.63±0.74 <sup>bc</sup>	4.50±1.07 <sup>abc</sup>	4.20±0.45 <sup>abc</sup>	3.71±0.95 <sup>bcd</sup>
Wax (unknown)	5.00±0.00	5.00±0.00	4.75±0.46 <sup>abc</sup>	4.38±0.74 <sup>abcd</sup>	4.20±0.84 <sup>abc</sup>	3.86±0.38 <sup>bc</sup>
PE microemulsion	5.00±0.00	5.00±0.00	4.88±0.35 <sup>ab</sup>	4.25±0.46 <sup>abcd</sup>	4.20±0.84 <sup>abc</sup>	3.86±0.90 <sup>bc</sup>
1.5% chitosan	5.00±0.00	5.00±0.00	4.75±0.46 <sup>abc</sup>	3.75±0.46 <sup>de</sup>	3.40±0.89 <sup>c</sup>	2.86±0.90 <sup>de</sup>
2.0% chitosan	5.00±0.00	5.00±0.00	4.50±0.53 <sup>cd</sup>	4.13±0.64 <sup>bcd</sup>	3.60±0.89 <sup>bc</sup>	2.71±1.11 <sup>ef</sup>
non-coated	5.00±0.00	5.00±0.00	4.25±0.46 <sup>d</sup>	3.25±1.04 <sup>e</sup>	2.00±0.71 <sup>d</sup>	1.86±0.69 <sup>f</sup>
LSD <sub>0.05</sub>	-	-	0.35	0.68	0.85	0.91
C.V. (%)	-	-	7.28	16.15	16.32	23.07

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

Evaluation of visual appearance (wilting and shriveling), using a scale of 1 to 5 where 5 = excellent, 4 = good, 3 = fair, 2 = poor and 1 = unusable. Fruit appearance was rated "unacceptable" when the score was below three.



**Table A.8** L\* of tangerine fruit cv. ‘Sai Nam Phueng’ coated with coating materials during storage at room temperature (23±3°C) and 56±5% relative humidity for 13 days

Treatments	Storage time (days)					
	0	1	4	7	10	13
Citrashine	55.62±3.88 <sup>cde</sup>	55.70±3.69 <sup>c</sup>	55.37±3.17 <sup>cde</sup>	55.30±3.46 <sup>def</sup>	54.31±2.71 <sup>d</sup>	53.94±2.46 <sup>de</sup>
Sealkote	59.96±1.44 <sup>abc</sup>	59.67±1.04 <sup>ab</sup>	59.15±2.03 <sup>abc</sup>	59.16±1.27 <sup>bc</sup>	59.78±1.82 <sup>b</sup>	57.64±2.03 <sup>bcd</sup>
Fomesa	56.09±2.05 <sup>bcade</sup>	55.96±2.21 <sup>c</sup>	57.35±1.17 <sup>bcde</sup>	55.54±2.23 <sup>def</sup>	56.09±2.00 <sup>bcd</sup>	55.62±2.52 <sup>bcde</sup>
Rosy Plus	55.03±2.11 <sup>e</sup>	54.73±2.61 <sup>c</sup>	53.95±1.83 <sup>e</sup>	54.24±1.85 <sup>ef</sup>	54.31±2.06 <sup>d</sup>	52.93±1.72 <sup>e</sup>
Citrosol AK	58.26±2.17 <sup>cde</sup>	56.93±0.86 <sup>bc</sup>	55.48±1.87 <sup>cde</sup>	56.41±0.87 <sup>bcdef</sup>	56.10±1.19 <sup>bcd</sup>	55.13±2.41 <sup>cde</sup>
Supershine-C	57.85±2.33 <sup>bcde</sup>	58.31±2.43 <sup>bc</sup>	57.15±3.51 <sup>bcde</sup>	57.73±2.61 <sup>bcde</sup>	57.19±3.54 <sup>bcd</sup>	57.95±3.19 <sup>bc</sup>
Zivdar	57.75±1.12 <sup>abcd</sup>	57.70±1.28 <sup>bc</sup>	58.05±0.83 <sup>abcd</sup>	57.82±1.38 <sup>bcd</sup>	57.73±1.05 <sup>bcd</sup>	57.52±1.90 <sup>bcd</sup>
Perfect Shine	56.10±3.85 <sup>bcde</sup>	56.49±3.31 <sup>bc</sup>	56.33±3.91 <sup>bcde</sup>	55.83±3.38 <sup>cdef</sup>	55.14±3.37 <sup>d</sup>	55.34±3.62 <sup>bcde</sup>
Wax (unknown)	58.97±4.17 <sup>ab</sup>	59.86±3.14 <sup>ab</sup>	59.46±3.00 <sup>ab</sup>	59.68±2.08 <sup>b</sup>	59.24±3.37 <sup>bc</sup>	59.22±3.7 <sup>6b</sup>
PE microemulsion	57.33±1.34 <sup>bcde</sup>	57.92±2.11 <sup>bc</sup>	56.58±1.89 <sup>bcde</sup>	57.11±0.68 <sup>bcdef</sup>	55.65±1.62 <sup>cd</sup>	55.93±2.37 <sup>bcde</sup>
1.5% chitosan	55.07±1.93 <sup>de</sup>	54.92±1.86 <sup>c</sup>	54.38±2.05 <sup>de</sup>	54.13±2.11 <sup>f</sup>	54.04±1.99 <sup>d</sup>	54.07±2.26 <sup>cde</sup>
2.0% chitosan non-coated	56.78±2.02 <sup>b<sup>cde</sup></sup>	56.95±2.11 <sup>bc</sup>	57.15±3.01 <sup>bcde</sup>	56.65±2.43 <sup>bcdef</sup>	56.35±2.33 <sup>bcd</sup>	56.25±3.28 <sup>bcde</sup>
LSD <sub>0.05</sub>	3.92	3.61	3.92	3.54	3.74	3.91
C.V. (%)	5.04	4.40	4.81	4.28	4.46	4.68

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.9** Chroma of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at room temperature (23±3°C) and 56±5% relative humidity for 13 days

Treatments	Storage time (days)					
	0	1	4	7	10	13
Citrushine	44.35±5.52 <sup>de</sup>	45.19±5.48 <sup>c</sup>	44.24±4.52 <sup>cd</sup>	43.40±5.15 <sup>cdef</sup>	41.95±5.10 <sup>ef</sup>	42.04±5.49 <sup>cd</sup>
Sealkote	51.05±1.09 <sup>abc</sup>	51.23±1.32 <sup>ab</sup>	50.37±1.17 <sup>ab</sup>	48.96±2.27 <sup>bc</sup>	50.35±1.78 <sup>b</sup>	48.68±1.02 <sup>b</sup>
Fomesa	45.16±2.67 <sup>de</sup>	44.12±2.80 <sup>c</sup>	43.13±1.20 <sup>cd</sup>	41.73±2.32 <sup>def</sup>	41.44±2.72 <sup>ef</sup>	42.10±2.46 <sup>cd</sup>
Rosy Plus	44.87±2.01 <sup>de</sup>	44.57±2.36 <sup>c</sup>	42.25±3.28 <sup>d</sup>	41.29±2.23 <sup>ef</sup>	42.58±1.93 <sup>def</sup>	40.61±2.41 <sup>d</sup>
Citrosol AK	48.44±3.08 <sup>bcd</sup>	47.89±1.63 <sup>bc</sup>	45.50±2.64 <sup>bcd</sup>	45.85±2.33 <sup>bcd</sup>	45.32±1.66 <sup>bcd</sup>	44.77±2.68 <sup>bcd</sup>
Supershine-C	46.76±2.64 <sup>bcd</sup>	47.20±3.50 <sup>bc</sup>	45.41±4.43 <sup>bcd</sup>	45.91±3.37 <sup>bcd</sup>	44.58±3.85 <sup>cdef</sup>	45.65±3.42 <sup>bcd</sup>
Zivdar	48.98±1.28 <sup>abcd</sup>	49.28±0.83 <sup>bc</sup>	48.74±1.28 <sup>bc</sup>	47.92±1.56 <sup>bc</sup>	48.02±1.39 <sup>bcd</sup>	46.49±1.67 <sup>bc</sup>
Perfect Shine	47.57±5.05 <sup>bcd</sup>	46.87±5.24 <sup>bc</sup>	46.55±6.38 <sup>bcd</sup>	45.32±4.95 <sup>cdef</sup>	44.26±5.11 <sup>cdef</sup>	45.56±5.30 <sup>bcd</sup>
Wax (unknown)	51.21±4.75 <sup>ab</sup>	51.23±4.00 <sup>ab</sup>	50.25±3.70 <sup>ab</sup>	50.02±3.82 <sup>b</sup>	49.11±4.22 <sup>bc</sup>	48.83±5.12 <sup>b</sup>
PE microemulsion	47.67±1.69 <sup>bcd</sup>	48.77±3.97 <sup>bc</sup>	46.86±3.16 <sup>bcd</sup>	47.11±1.60 <sup>bcd</sup>	45.56±2.62 <sup>bcd</sup>	46.00±2.94 <sup>bcd</sup>
1.5% chitosan	43.34±3.41 <sup>c</sup>	44.19±2.32 <sup>c</sup>	42.71±3.41 <sup>d</sup>	40.20±3.30 <sup>f</sup>	39.80±4.00 <sup>f</sup>	41.64±4.63 <sup>cd</sup>
2.0% chitosan	45.68±5.21 <sup>cde</sup>	45.79±5.07 <sup>bc</sup>	46.33±5.44 <sup>bcd</sup>	43.35±6.57 <sup>cdef</sup>	42.95±4.74 <sup>def</sup>	43.24±5.96 <sup>bcd</sup>
non-coated	54.34±6.60 <sup>a</sup>	54.94±6.50 <sup>a</sup>	55.20±7.63 <sup>a</sup>	57.56±6.32 <sup>a</sup>	60.52±5.35 <sup>a</sup>	62.74±3.31 <sup>a</sup>
LSD <sub>0.05</sub>	5.53	5.51	5.96	5.68	5.55	5.82
C.V. (%)	8.11	8.07	8.92	8.54	8.24	8.60

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.10** Hue angle (degree) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at room temperature ( $23\pm 3^\circ\text{C}$ ) and  $56\pm 5\%$  relative humidity for 7 days

Treatments	Storage time (days)					
	0	1	4	7	10	13
Citratshine	104.65 $\pm$ 5.15 <sup>abcd</sup>	104.13 $\pm$ 4.54 <sup>abcd</sup>	103.78 $\pm$ 4.20 <sup>bcd</sup>	104.25 $\pm$ 4.65 <sup>bcd</sup>	105.55 $\pm$ 4.92 <sup>abcd</sup>	106.18 $\pm$ 3.99 <sup>abc</sup>
Sealkote	101.60 $\pm$ 3.42 <sup>d</sup>	101.75 $\pm$ 3.29 <sup>cd</sup>	101.85 $\pm$ 3.13 <sup>cd</sup>	101.33 $\pm$ 3.46 <sup>cde</sup>	100.20 $\pm$ 3.90 <sup>d</sup>	101.27 $\pm$ 3.55 <sup>cd</sup>
Fomesa	109.15 $\pm$ 2.08 <sup>a</sup>	109.23 $\pm$ 2.30 <sup>a</sup>	109.38 $\pm$ 2.00 <sup>a</sup>	110.20 $\pm$ 1.77 <sup>a</sup>	110.05 $\pm$ 1.64 <sup>a</sup>	109.88 $\pm$ 1.90 <sup>a</sup>
Rosy Plus	104.80 $\pm$ 3.36 <sup>abcd</sup>	104.88 $\pm$ 2.87 <sup>abc</sup>	105.70 $\pm$ 2.18 <sup>abc</sup>	106.00 $\pm$ 1.97 <sup>abcd</sup>	105.08 $\pm$ 2.61 <sup>abcd</sup>	105.78 $\pm$ 2.58 <sup>abcd</sup>
Citrosol AK	104.55 $\pm$ 2.12 <sup>abcd</sup>	105.75 $\pm$ 2.53 <sup>abc</sup>	105.60 $\pm$ 2.17 <sup>abc</sup>	105.63 $\pm$ 2.67 <sup>abcd</sup>	105.20 $\pm$ 2.91 <sup>abcd</sup>	105.00 $\pm$ 2.90 <sup>abcd</sup>
Supershine-C	107.48 $\pm$ 3.05 <sup>ab</sup>	107.43 $\pm$ 3.26 <sup>ab</sup>	107.95 $\pm$ 2.34 <sup>ab</sup>	107.33 $\pm$ 2.50 <sup>ab</sup>	108.45 $\pm$ 2.98 <sup>ab</sup>	108.28 $\pm$ 2.74 <sup>ab</sup>
Zivdar	103.43 $\pm$ 4.88 <sup>bcd</sup>	104.15 $\pm$ 4.80 <sup>abcd</sup>	103.55 $\pm$ 4.45 <sup>bcd</sup>	103.88 $\pm$ 5.22 <sup>bcd</sup>	103.70 $\pm$ 4.77 <sup>bcd</sup>	103.38 $\pm$ 6.06 <sup>bcd</sup>
Perfect Shine	101.65 $\pm$ .365 <sup>d</sup>	101.83 $\pm$ 3.26 <sup>cd</sup>	101.08 $\pm$ 3.27 <sup>cd</sup>	101.50 $\pm$ 2.42 <sup>cde</sup>	100.45 $\pm$ 3.13 <sup>d</sup>	99.98 $\pm$ 3.47 <sup>d</sup>
Wax (unknown)	101.73 $\pm$ 3.63 <sup>cd</sup>	101.55 $\pm$ 4.73 <sup>cd</sup>	101.55 $\pm$ 5.00 <sup>cd</sup>	101.23 $\pm$ 5.86 <sup>de</sup>	101.90 $\pm$ 5.06 <sup>cd</sup>	101.75 $\pm$ 4.58 <sup>cd</sup>
PE microemulsion	104.60 $\pm$ 2.63 <sup>abcd</sup>	103.33 $\pm$ 4.04 <sup>bcd</sup>	103.63 $\pm$ 3.41 <sup>bcd</sup>	103.35 $\pm$ 2.56 <sup>bcd</sup>	105.68 $\pm$ 2.86 <sup>abcd</sup>	103.45 $\pm$ 4.26 <sup>bcd</sup>
1.5% chitosan	103.95 $\pm$ 3.02 <sup>bcd</sup>	103.45 $\pm$ 2.11 <sup>bcd</sup>	101.00 $\pm$ 2.56 <sup>bcd</sup>	104.43 $\pm$ 2.63 <sup>bcd</sup>	104.28 $\pm$ 2.53 <sup>bcd</sup>	103.25 $\pm$ 3.23 <sup>bcd</sup>
2.0% chitosan	106.90 $\pm$ 2.10 <sup>abc</sup>	106.43 $\pm$ 3.62 <sup>abc</sup>	105.48 $\pm$ 2.73 <sup>abc</sup>	106.78 $\pm$ 3.53 <sup>abc</sup>	107.00 $\pm$ 3.79 <sup>abc</sup>	106.95 $\pm$ 4.19 <sup>abc</sup>
non-coated	99.65 $\pm$ 5.64 <sup>d</sup>	99.48 $\pm$ 5.27 <sup>d</sup>	98.88 $\pm$ 6.74 <sup>d</sup>	96.10 $\pm$ 6.35 <sup>e</sup>	93.30 $\pm$ 6.40 <sup>e</sup>	90.48 $\pm$ 6.58 <sup>e</sup>
LSD <sub>0.05</sub>	5.17	5.32	5.22	5.52	5.72	6.03
C.V. (%)	3.48	3.57	3.51	3.66	3.74	3.96

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.11** Total soluble solids (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at room temperature ( $23\pm 3^\circ\text{C}$ ) and  $56\pm 5\%$  relative humidity for 13 days

Treatments	Storage time (days)					
	0	1	4	7	10	13
Citrahshine	10.90±0.89	11.80±0.36 <sup>ab</sup>	12.10±0.36 <sup>ab</sup>	11.70±0.98 <sup>ab</sup>	12.10±0.46 <sup>ab</sup>	11.57±0.55 <sup>ab</sup>
Sealkote	10.90±0.89	11.40±0.46 <sup>abc</sup>	11.73±0.96 <sup>ab</sup>	11.13±0.45 <sup>abc</sup>	10.97±0.38 <sup>b</sup>	10.30±0.85 <sup>b</sup>
Fomesa	10.90±0.89	11.23±0.35 <sup>abc</sup>	10.47±1.29 <sup>c</sup>	11.37±0.60 <sup>ab</sup>	12.07±1.72 <sup>ab</sup>	10.40±0.89 <sup>b</sup>
Rosy Plus	10.90±0.89	11.07±0.78 <sup>bc</sup>	12.40±0.61 <sup>a</sup>	12.27±0.76 <sup>a</sup>	11.07±1.27 <sup>ab</sup>	12.47±1.40 <sup>a</sup>
Citrosol AK	10.90±0.89	10.23±0.45 <sup>c</sup>	11.80±0.44 <sup>ab</sup>	11.30±0.44 <sup>ab</sup>	12.00±0.87 <sup>ab</sup>	10.80±0.53 <sup>b</sup>
Supershine-C	10.90±0.89	11.73±1.86 <sup>ab</sup>	11.40±0.35 <sup>abc</sup>	10.80±1.21 <sup>bc</sup>	12.00±0.40 <sup>ab</sup>	10.43±0.49 <sup>b</sup>
Zivdar	10.90±0.89	10.73±0.55 <sup>bc</sup>	12.40±0.56 <sup>a</sup>	12.17±1.00 <sup>a</sup>	11.30±1.73 <sup>ab</sup>	11.73±1.72 <sup>ab</sup>
Perfect Shine	10.90±0.89	11.47±0.49 <sup>ab</sup>	12.10±0.40 <sup>ab</sup>	11.13±0.32 <sup>abc</sup>	11.17±0.55 <sup>ab</sup>	12.60±0.17 <sup>a</sup>
Wax (unknown)	10.90±0.89	11.23±0.61 <sup>abc</sup>	12.20±0.17 <sup>ab</sup>	11.67±1.03 <sup>ab</sup>	11.57±0.49 <sup>ab</sup>	11.83±1.11 <sup>ab</sup>
PE microemulsion	10.90±0.89	11.50±0.17 <sup>ab</sup>	12.00±0.10 <sup>ab</sup>	12.27±0.50 <sup>a</sup>	11.67±0.65 <sup>ab</sup>	11.93±1.67 <sup>ab</sup>
1.5% chitosan	10.90±0.89	11.37±0.31 <sup>a</sup>	11.17±0.55 <sup>bc</sup>	10.90±0.26 <sup>bc</sup>	12.10±0.20 <sup>ab</sup>	11.70±0.76 <sup>ab</sup>
2.0% chitosan	10.90±0.89	11.07±0.61 <sup>bc</sup>	11.30±0.95 <sup>bc</sup>	10.83±0.68 <sup>bc</sup>	11.17±0.64 <sup>ab</sup>	11.70±0.61 <sup>ab</sup>
non-coated	10.90±0.89	11.67±0.50 <sup>ab</sup>	11.67±0.57 <sup>ab</sup>	9.90±0.70 <sup>c</sup>	12.50±0.30 <sup>a</sup>	11.30±0.26 <sup>ab</sup>
LSD <sub>0.05</sub>	1.49	1.18	1.09	1.25	1.50	1.64
C.V. (%)	8.15	6.18	5.51	6.57	7.65	8.51

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.12** Titratable acidity (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at room temperature ( $23\pm 3^\circ\text{C}$ ) and  $56\pm 5\%$  relative humidity for 13 days

Treatments	Storage time (days)					
	0	1	4	7		
Citrahshine	0.66±0.21	0.52±0.14 <sup>c</sup>	0.68±0.06 <sup>ab</sup>	0.59±0.04 <sup>ab</sup>	10	13
Sealkote	0.66±0.21	0.59±0.08 <sup>bc</sup>	0.61±0.05 <sup>abc</sup>	0.59±0.09 <sup>ab</sup>	0.50±0.06 <sup>abcd</sup>	0.48±0.05 <sup>c</sup>
Fomesa	0.66±0.21	0.53±0.07 <sup>c</sup>	0.53±0.04 <sup>bc</sup>	0.53±0.06 <sup>bc</sup>	0.69±0.11 <sup>a</sup>	0.55±0.10 <sup>abc</sup>
Rosy Plus	0.66±0.21	0.63±0.02 <sup>abc</sup>	0.58±0.06 <sup>bc</sup>	0.71±0.07 <sup>a</sup>	0.49±0.05 <sup>bcd</sup>	0.50±0.03 <sup>bc</sup>
Citrosol AK	0.66±0.21	0.57±0.09 <sup>bc</sup>	0.65±0.05 <sup>abc</sup>	0.48±0.10 <sup>bc</sup>	0.50±0.05 <sup>abc</sup>	0.49±0.08 <sup>c</sup>
Supershine-C	0.66±0.21	0.72±0.13 <sup>ab</sup>	0.59±0.12 <sup>bc</sup>	0.50±0.07 <sup>bc</sup>	0.40±0.05 <sup>cd</sup>	0.55±0.02 <sup>abc</sup>
Zivdar	0.66±0.21	0.65±0.19 <sup>abc</sup>	0.65±0.17 <sup>abc</sup>	0.44±0.07 <sup>c</sup>	0.31±0.27 <sup>d</sup>	0.56±0.12 <sup>abc</sup>
Perfect Shine	0.66±0.21	0.62±0.10 <sup>abc</sup>	0.56±0.04 <sup>b</sup>	0.45±0.04 <sup>c</sup>	0.51±0.08 <sup>abc</sup>	0.45±0.11 <sup>c</sup>
Wax (unknown)	0.66±0.21	0.78±0.02 <sup>a</sup>	0.76±0.14 <sup>a</sup>	0.55±0.17 <sup>bc</sup>	0.52±0.05 <sup>abc</sup>	0.65±0.04 <sup>a</sup>
PE microemulsion	0.66±0.21	0.55±0.12 <sup>bc</sup>	0.65±0.12 <sup>abc</sup>	0.56±0.09 <sup>bc</sup>	0.53±0.03 <sup>abc</sup>	0.56±0.07 <sup>abc</sup>
1.5% chitosan	0.66±0.21	0.64±0.14 <sup>abc</sup>	0.51±0.05 <sup>c</sup>	0.49±0.04 <sup>bc</sup>	0.51±0.12 <sup>abc</sup>	0.51±0.15 <sup>abc</sup>
2.0% chitosan	0.66±0.21	0.57±0.01 <sup>bc</sup>	0.59±0.13 <sup>bc</sup>	0.50±0.06 <sup>bc</sup>	0.49±0.06 <sup>abcd</sup>	0.47±0.03 <sup>c</sup>
non-coated	0.66±0.21	0.59±0.04 <sup>bc</sup>	0.57±0.09 <sup>bc</sup>	0.48±0.06 <sup>bc</sup>	0.62±0.23 <sup>ab</sup>	0.56±0.12 <sup>abc</sup>
LSD <sub>0.05</sub>	0.34	0.17	0.16	0.14	0.20	0.64±0.01 <sup>ab</sup>
C.V. (%)	31.09	16.74	15.43	15.40	22.75	15.72

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.13** TSS/TA ratio of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at room temperature (23±3°C) and 56±5% relative humidity for 13 days

Treatments	Storage time (days)					
	0	1	4	7	10	13
Citrashine	17.93±7.21	24.09±6.83 <sup>a</sup>	17.90±1.72 <sup>ab</sup>	19.85±1.68 <sup>bc</sup>	24.49±2.91 <sup>abc</sup>	24.33±3.43 <sup>abc</sup>
Sealkote	17.93±7.21	19.56±3.19 <sup>ab</sup>	19.10±1.62 <sup>ab</sup>	19.13±3.13 <sup>bc</sup>	18.77±1.48 <sup>cd</sup>	19.21±2.88 <sup>d</sup>
Fomesa	17.93±7.21	21.49±3.03 <sup>ab</sup>	19.67±1.82 <sup>ab</sup>	21.86±3.91 <sup>bc</sup>	17.56±1.07 <sup>d</sup>	20.76±2.78 <sup>bcd</sup>
Rosy Plus	17.93±7.21	17.59±0.71 <sup>b</sup>	21.62±1.31 <sup>a</sup>	17.46±2.79 <sup>c</sup>	22.83±2.85 <sup>bcd</sup>	25.52±2.95 <sup>ab</sup>
Citrosol AK	17.93±7.21	18.28±3.72 <sup>ab</sup>	18.20±2.05 <sup>ab</sup>	24.05±4.69 <sup>ab</sup>	23.95±2.44 <sup>bc</sup>	19.79±1.56 <sup>cd</sup>
Supershine-C	17.93±7.21	16.44±0.52 <sup>b</sup>	20.01±4.30 <sup>ab</sup>	21.89±3.53 <sup>bc</sup>	30.30±4.52 <sup>a</sup>	18.95±2.89 <sup>d</sup>
Zivdar	17.93±7.21	17.58±6.31 <sup>b</sup>	19.59±3.81 <sup>ab</sup>	28.45±6.00 <sup>a</sup>	27.04±5.25 <sup>ab</sup>	26.35±2.78 <sup>a</sup>
Perfect Shine	17.93±7.21	18.79±2.50 <sup>ab</sup>	21.54±2.09 <sup>a</sup>	24.94±1.70 <sup>ab</sup>	22.17±2.29 <sup>bcd</sup>	19.63±1.46 <sup>cd</sup>
Wax (unknown)	17.93±7.21	14.34±0.93 <sup>b</sup>	16.47±2.75 <sup>b</sup>	22.47±5.80 <sup>abc</sup>	22.23±1.25 <sup>bcd</sup>	21.28±3.69 <sup>bcd</sup>
PE microemulsion	17.93±7.21	21.55±4.17 <sup>ab</sup>	18.79±3.84 <sup>ab</sup>	22.32±4.35 <sup>abc</sup>	21.78±1.87 <sup>bcd</sup>	24.48±4.81 <sup>abc</sup>
1.5% chitosan	17.93±7.21	20.13±4.27 <sup>ab</sup>	21.81±2.37 <sup>a</sup>	22.49±1.29 <sup>abc</sup>	24.66±4.72 <sup>abc</sup>	24.72±1.18 <sup>ab</sup>
2.0% chitosan	17.93±7.21	19.61±1.49 <sup>ab</sup>	19.82±4.29 <sup>ab</sup>	21.90±4.27 <sup>bc</sup>	22.74±2.09 <sup>bcd</sup>	21.30±3.66 <sup>bcd</sup>
non-coated	17.93±7.21	19.63±1.16 <sup>ab</sup>	20.62±1.86 <sup>ab</sup>	20.85±2.47 <sup>bc</sup>	21.80±7.23 <sup>bcd</sup>	17.71±0.39 <sup>d</sup>
LSD <sub>0.05</sub>	12.11	6.01	4.71	6.38	5.92	4.86
C.V. (%)	40.21	18.69	14.27	17.16	15.03	13.24

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.14** pH of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at room temperature (23±3°C) and 56±5% relative humidity for 13 days

Treatments	Storage time (days)					
	0	1	4	7	10	13
Citrushine	3.35±0.18	3.12±0.37 <sup>bcd</sup>	3.08±0.02 <sup>cde</sup>	3.23±0.19 <sup>d</sup>	3.43±0.10 <sup>bcd</sup>	3.49±0.05
Sealkote	3.35±0.18	2.93±0.11 <sup>e</sup>	3.05±0.14 <sup>de</sup>	3.29±0.11 <sup>bcd</sup>	3.32±0.16 <sup>bcd</sup>	3.55±0.12
Fomesa	3.35±0.18	2.94±0.13 <sup>de</sup>	3.07±0.01 <sup>cde</sup>	3.36±0.02 <sup>abcd</sup>	3.38±0.02 <sup>bcd</sup>	3.43±0.25
Rosy Plus	3.35±0.18	2.87±0.05 <sup>e</sup>	3.00±0.16 <sup>e</sup>	3.25±0.18 <sup>cd</sup>	3.17±0.13 <sup>e</sup>	3.32±0.15
Citrosol AK	3.35±0.18	3.04±0.22 <sup>cde</sup>	3.21±0.05 <sup>abcde</sup>	3.45±0.17 <sup>abc</sup>	3.29±0.05 <sup>cde</sup>	3.49±0.12
Supershine-C	3.35±0.18	3.03±0.06 <sup>cde</sup>	3.39±0.14 <sup>a</sup>	3.39±0.10 <sup>abcd</sup>	3.60±0.09 <sup>a</sup>	3.36±0.13
Zivdar	3.35±0.18	3.02±0.14 <sup>cde</sup>	3.23±0.27 <sup>abcd</sup>	3.53±0.04 <sup>a</sup>	3.33±0.07 <sup>bcd</sup>	3.59±0.16
Perfect Shine	3.35±0.18	3.20±0.10 <sup>abcd</sup>	3.26±0.12 <sup>abcd</sup>	3.45±0.01 <sup>abc</sup>	3.41±0.07 <sup>bcd</sup>	3.36±0.12
Wax (unknown)	3.35±0.18	3.06±0.06 <sup>cde</sup>	3.09±0.15 <sup>bcd</sup>	3.48±0.15 <sup>ab</sup>	3.44±0.02 <sup>abc</sup>	3.43±0.33
PE microemulsion	3.35±0.18	3.34±0.14 <sup>ab</sup>	3.32±0.12 <sup>a</sup>	3.47±0.15 <sup>ab</sup>	3.28±0.08 <sup>cde</sup>	3.44±0.15
1.5% chitosan	3.35±0.18	3.34±0.14 <sup>ab</sup>	3.17±0.09 <sup>abcde</sup>	3.49±0.12 <sup>ab</sup>	3.47±0.15 <sup>ab</sup>	3.40±0.18
2.0% chitosan	3.35±0.18	3.27±0.04 <sup>abc</sup>	3.28±0.15 <sup>abc</sup>	3.43±0.16 <sup>abcd</sup>	3.35±0.06 <sup>bcd</sup>	3.46±0.05
non-coated	3.35±0.18	3.46±0.14 <sup>a</sup>	3.31±0.05 <sup>ab</sup>	3.49±0.08 <sup>ab</sup>	3.27±0.15 <sup>de</sup>	3.47±0.07
0LSD <sub>0.05</sub>	0.31	0.26	0.22	0.22	0.17	0.27
C.V. (%)	5.50	4.96	4.12	3.76	2.93	4.68

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.15** Vitamin C (mg/100 ml juice) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at room temperature ( $23\pm 3^\circ\text{C}$ ) and  $56\pm 5\%$  relative humidity for 13 days

Treatments	Storage time (days)					
	0	1	4	7	10	13
Citrahine	20.26 $\pm$ 1.13	21.57 $\pm$ 1.96	20.51 $\pm$ 2.94 <sup>ab</sup>	21.02 $\pm$ 1.91	23.68 $\pm$ 1.97 <sup>ab</sup>	24.18 $\pm$ 1.13 <sup>a</sup>
Sealkote	20.26 $\pm$ 1.13	22.88 $\pm$ 1.13	21.15 $\pm$ 1.92 <sup>ab</sup>	21.02 $\pm$ 1.91	21.71 $\pm$ 3.42 <sup>b</sup>	19.61 $\pm$ 1.96 <sup>bc</sup>
Fomesa	20.26 $\pm$ 1.13	20.92 $\pm$ 1.13	22.44 $\pm$ 2.22 <sup>a</sup>	21.66 $\pm$ 1.10	25.00 $\pm$ 1.14 <sup>a</sup>	22.88 $\pm$ 2.26 <sup>ab</sup>
Rosy Plus	20.26 $\pm$ 1.13	22.22 $\pm$ 1.13	22.44 $\pm$ 2.22 <sup>a</sup>	21.66 $\pm$ 2.21	24.34 $\pm$ 1.14 <sup>ab</sup>	23.53 $\pm$ 3.40 <sup>a</sup>
Citrosol AK	20.26 $\pm$ 1.13	22.22 $\pm$ 1.13	22.44 $\pm$ 2.22 <sup>a</sup>	20.38 $\pm$ 2.21	21.71 $\pm$ 3.42 <sup>ab</sup>	22.22 $\pm$ 1.13 <sup>ab</sup>
Supershine-C	20.26 $\pm$ 1.13	20.92 $\pm$ 2.26	21.15 $\pm$ 0.00 <sup>ab</sup>	21.66 $\pm$ 1.10	21.05 $\pm$ 3.01 <sup>ab</sup>	22.86 $\pm$ 2.26 <sup>ab</sup>
Zivdar	20.26 $\pm$ 1.13	22.22 $\pm$ 2.26	19.87 $\pm$ 1.11 <sup>ab</sup>	19.75 $\pm$ 1.10	20.39 $\pm$ 1.14 <sup>b</sup>	16.99 $\pm$ 2.26 <sup>c</sup>
Perfect Shine	20.26 $\pm$ 1.13	22.88 $\pm$ 1.13	20.51 $\pm$ 2.22 <sup>ab</sup>	19.75 $\pm$ 2.21	23.03 $\pm$ 2.28 <sup>ab</sup>	22.88 $\pm$ 1.13 <sup>ab</sup>
Wax (unknown)	20.26 $\pm$ 1.13	21.57 $\pm$ 1.96	20.51 $\pm$ 2.22 <sup>ab</sup>	21.02 $\pm$ 1.91	21.71 $\pm$ 1.97 <sup>ab</sup>	22.22 $\pm$ 3.00 <sup>ab</sup>
PE microemulsion	20.26 $\pm$ 1.13	20.92 $\pm$ 3.00	17.95 $\pm$ 2.22 <sup>b</sup>	21.02 $\pm$ 1.91	22.37 $\pm$ 1.14 <sup>ab</sup>	22.22 $\pm$ 3.00 <sup>ab</sup>
1.5% chitosan	20.26 $\pm$ 1.13	21.57 $\pm$ 3.40	23.72 $\pm$ 4.44 <sup>a</sup>	21.66 $\pm$ 1.10	22.37 $\pm$ 3.01 <sup>ab</sup>	23.53 $\pm$ 1.96 <sup>a</sup>
2.0% chitosan	20.26 $\pm$ 1.13	20.92 $\pm$ 3.00	19.87 $\pm$ 2.22 <sup>ab</sup>	20.38 $\pm$ 1.10	23.68 $\pm$ 3.95 <sup>b</sup>	23.53 $\pm$ 1.96 <sup>a</sup>
non-coated	20.26 $\pm$ 1.13	20.26 $\pm$ 1.13	17.95 $\pm$ 2.22 <sup>b</sup>	19.11 $\pm$ 0.00	20.39 $\pm$ 1.17 <sup>b</sup>	18.30 $\pm$ 1.13 <sup>c</sup>
LSD <sub>0.05</sub>	1.90	3.46	3.97	2.77	4.08	3.65
C.V. (%)	5.59	9.52	11.37	7.93	10.83	9.92

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )



**Table A.16** Weight loss (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)									
	0	4	7	10	13	16	19	22		
<b>Factor 1 : Storage temperature</b>										
5°C	0.00±0.00	1.09±0.49 <sup>b</sup>	1.71±0.79 <sup>b</sup>	2.41±1.09 <sup>b</sup>	3.11±1.41 <sup>b</sup>	3.73±1.69	4.37±1.96	4.91±2.15		
10°C	0.00±0.00	1.08±0.33 <sup>b</sup>	1.65±0.50 <sup>b</sup>	2.30±0.71 <sup>b</sup>	2.94±0.85 <sup>b</sup>	3.55±1.01	4.12±1.18	4.73±1.35		
Room temperature	0.00±0.00	3.73±1.33 <sup>a</sup>	5.88±1.82 <sup>a</sup>	7.748±2.26 <sup>a</sup>	10.02±2.88 <sup>a</sup>	-	-	-		
<b>Factor 2 : Coating materials</b>										
Citrashine	0.00±0.00	1.36±1.07 <sup>b</sup>	2.12±1.72 <sup>b</sup>	2.90±2.31 <sup>c</sup>	3.80±2.97 <sup>c</sup>	2.16±0.44 <sup>d</sup>	2.51±0.52 <sup>d</sup>	2.90±0.59 <sup>c</sup>		
Sealkote	0.00±0.00	1.40±1.02 <sup>b</sup>	2.24±1.74 <sup>b</sup>	3.01±2.30 <sup>c</sup>	3.90±2.99 <sup>c</sup>	2.26±0.30 <sup>cd</sup>	2.62±0.33 <sup>cd</sup>	3.00±0.37 <sup>c</sup>		
Rosy Plus	0.00±0.00	1.48±1.00 <sup>b</sup>	2.42±1.64 <sup>b</sup>	3.32±2.20 <sup>bc</sup>	4.31±2.88 <sup>bc</sup>	2.86±0.32 <sup>c</sup>	3.34±0.39 <sup>c</sup>	3.84±0.48 <sup>c</sup>		
Zivdar	0.00±0.00	1.54±0.99 <sup>b</sup>	2.35±1.51 <sup>b</sup>	3.15±1.95 <sup>bc</sup>	4.03±2.48 <sup>bc</sup>	2.84±0.37 <sup>c</sup>	3.32±0.43 <sup>c</sup>	3.83±0.49 <sup>c</sup>		
Perfect Shine	0.00±0.00	2.35±1.65 <sup>ab</sup>	3.58±2.40 <sup>ab</sup>	4.72±2.97 <sup>abc</sup>	5.94±3.64 <sup>abc</sup>	4.22±0.42 <sup>b</sup>	4.95±0.51 <sup>b</sup>	5.71±0.59 <sup>b</sup>		
PE microemulsion	0.00±0.00	1.99±1.48 <sup>b</sup>	3.15±2.26 <sup>b</sup>	4.33±2.90 <sup>abc</sup>	5.62±3.69 <sup>abc</sup>	3.78±0.43 <sup>b</sup>	4.44±0.50 <sup>b</sup>	5.13±0.57 <sup>b</sup>		
2.0% chitosan	0.00±0.00	2.37±1.34 <sup>ab</sup>	3.85±2.13 <sup>ab</sup>	5.29±2.74 <sup>ab</sup>	6.84±3.64 <sup>ab</sup>	5.24±0.78 <sup>a</sup>	6.08±0.94 <sup>a</sup>	6.92±1.04 <sup>a</sup>		
non-coated	0.00±0.00	3.25±2.30 <sup>a</sup>	4.95±3.48 <sup>a</sup>	6.57±4.38 <sup>a</sup>	8.43±5.70 <sup>a</sup>	5.60±1.46 <sup>a</sup>	6.49±1.70 <sup>a</sup>	7.00±2.14 <sup>a</sup>		
Factor 1	-	*	*	*	*	ns	ns	ns		
Factor 2	-	*	*	*	*	*	*	*		
Factor 1×2	-	*	*	*	*	*	*	*		

Means followed by different superscript letters within a column are significantly different (P≤0.05) \* = significant ns = non significant

**Table A.16 (continued)** Weight loss (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)						
	25	28	31	34	37	40	43
<b>Factor 1 : Storage temperature</b>							
5°C	5.64±2.47	6.34±2.86	7.07±3.05	7.77±3.33	8.53±3.63	9.15±4.01	11.94±8.99
10°C	5.36±1.52	6.04±1.71	-	-	-	-	-
Room temperature	-	-	-	-	-	-	-
<b>Factor 2 : Coating materials</b>							
Citrashine	3.28±0.68 <sup>d</sup>	3.69±0.77 <sup>d</sup>	4.00±0.44 <sup>c</sup>	4.41±0.48 <sup>c</sup>	4.84±0.53 <sup>c</sup>	5.21±0.56 <sup>c</sup>	5.69±0.63 <sup>c</sup>
Sealkote	3.38±0.42 <sup>cd</sup>	3.81±0.47 <sup>cd</sup>	3.94±0.28 <sup>c</sup>	4.34±0.31 <sup>c</sup>	4.77±0.34 <sup>c</sup>	5.15±0.38 <sup>c</sup>	5.59±0.39 <sup>c</sup>
Rosy Plus	4.34±0.58 <sup>c</sup>	4.89±0.68 <sup>c</sup>	5.19±0.51 <sup>c</sup>	5.71±0.58 <sup>c</sup>	6.27±0.65 <sup>c</sup>	6.06±0.97 <sup>c</sup>	7.36±0.79 <sup>c</sup>
Zivdar	4.35±0.56 <sup>c</sup>	4.91±0.64 <sup>c</sup>	5.38±0.36 <sup>c</sup>	5.93±0.42 <sup>c</sup>	6.54±0.46 <sup>c</sup>	7.11±0.51 <sup>c</sup>	7.73±0.56 <sup>c</sup>
Perfect Shine	6.46±0.68 <sup>b</sup>	7.30±0.77 <sup>b</sup>	8.13±0.50 <sup>b</sup>	8.96±0.57 <sup>b</sup>	9.87±0.63 <sup>b</sup>	10.73±0.71 <sup>b</sup>	11.66±0.79 <sup>b</sup>
PE microemulsion	5.84±0.65 <sup>b</sup>	6.63±0.73 <sup>b</sup>	7.35±1.11 <sup>b</sup>	8.07±1.20 <sup>b</sup>	8.87±1.31 <sup>b</sup>	9.64±1.39 <sup>b</sup>	10.47±1.50 <sup>b</sup>
2.0% chitosan	7.75±1.14 <sup>a</sup>	8.68±1.27 <sup>a</sup>	10.68±0.58 <sup>a</sup>	11.70±0.58 <sup>a</sup>	12.77±0.60 <sup>a</sup>	13.80±0.60 <sup>a</sup>	14.87±0.62 <sup>a</sup>
non-coated	8.31±2.15 <sup>a</sup>	9.32±2.41 <sup>a</sup>	11.92±3.05 <sup>a</sup>	13.06±3.29 <sup>a</sup>	14.29±3.56 <sup>a</sup>	15.51±3.84 <sup>a</sup>	16.77±4.11 <sup>a</sup>
Factor 1	ns	ns	-	-	-	-	-
Factor 2	*	ns	-	-	-	-	-
Factor 1×2	*	ns	-	-	-	-	-

Means followed by different superscript letters within a column are significantly different (P≤0.05)

\* = significant

ns = non significant

**Table A.17** Internal O<sub>2</sub> (%) of tangerine fruit cv. ‘Sai Nam Phueng’ coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)			
	0	10	25	43
<b>Factor 1 : Storage temperature</b>				
5°C	16.28±0.54	10.54±5.13 <sup>a</sup>	8.16±6.22	5.50±5.08
10°C	16.28±0.54	8.90±5.41 <sup>a</sup>	7.37±4.97	-
Room temperature	16.28±0.54	3.78±4.42 <sup>b</sup>	-	-
<b>Factor 2 : Coating materials</b>				
Citrashine	16.28±0.54	2.51±1.45 <sup>f</sup>	1.80±1.06 <sup>e</sup>	5.73±2.83 <sup>bc</sup>
Sealkote	16.28±0.54	4.87±3.50 <sup>def</sup>	3.38±1.88 <sup>de</sup>	1.34±0.30 <sup>c</sup>
Rosy Plus	16.28±0.54	8.71±6.81 <sup>bed</sup>	5.03±1.12 <sup>cde</sup>	3.79±1.35 <sup>bc</sup>
Zivdar	16.28±0.54	7.47±4.92 <sup>bcd</sup>	6.43±1.88 <sup>cd</sup>	7.01±2.97 <sup>bc</sup>
Perfect Shine	16.28±0.54	4.20±2.04 <sup>ef</sup>	8.33±5.36 <sup>bc</sup>	1.71±0.53 <sup>c</sup>
PE microemulsion	16.28±0.54	8.43±4.52 <sup>bcd</sup>	10.95±3.91 <sup>b</sup>	8.86±1.90 <sup>ab</sup>
2.0% chitosan	16.28±0.54	10.32±6.08 <sup>b</sup>	11.38±2.35 <sup>b</sup>	1.93±0.68 <sup>c</sup>
non-coated	16.28±0.54	16.28±1.78 <sup>a</sup>	16.32±1.46 <sup>a</sup>	13.64±2.05 <sup>a</sup>
Factor 1	ns	*	ns	-
Factor 2	ns	*	*	-
Factor 1×2	ns	*	ns	-

Means followed by different superscript letters within a column are significantly different (P≤0.05)

\* = significant

ns = non significant

**Table A.18** Internal CO<sub>2</sub> (%) of tangerine fruit cv. 'Sai Nam Phueung' coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)			
	0	10	25	43
<b>Factor 1 : Storage temperature</b>				
5°C	7.37±1.29	4.60±1.20 <sup>b</sup>	8.90±2.64	14.87±5.06
10°C	7.37±1.29	5.98±2.15 <sup>b</sup>	9.78±2.78	-
Room temperature	7.37±1.29	14.95±10.12 <sup>a</sup>	-	-
<b>Factor 2 : Coating materials</b>				
Citrashine	7.37±1.34	16.45±3.47 <sup>a</sup>	12.24±3.09 <sup>a</sup>	15.79±5.13 <sup>b</sup>
Sealkote	7.37±1.34	8.43±4.86 <sup>b</sup>	9.54±0.68 <sup>bc</sup>	16.27±4.30 <sup>ab</sup>
Rosy Plus	7.37±1.34	9.21±9.60 <sup>b</sup>	9.51±3.91 <sup>bc</sup>	12.94±6.01 <sup>b</sup>
Zivdar	7.37±1.34	7.55±2.73 <sup>b</sup>	10.98±1.41 <sup>ab</sup>	13.45±4.48 <sup>b</sup>
Perfect Shine	7.37±1.34	6.95±2.89 <sup>b</sup>	7.68±1.57 <sup>cd</sup>	13.39±2.12 <sup>b</sup>
PE microemulsion	7.37±1.34	5.90±1.32 <sup>bc</sup>	8.63±1.71 <sup>bc</sup>	13.34±3.20 <sup>b</sup>
2.0% chitosan	7.37±1.34	9.69±3.84 <sup>b</sup>	9.77±1.22 <sup>abc</sup>	23.39±2.98 <sup>a</sup>
non-coated	7.37±1.34	3.72±1.52 <sup>c</sup>	5.68±1.94 <sup>d</sup>	10.43±3.48 <sup>b</sup>
Factor 1	ns	*	ns	-
Factor 2	ns	*	*	-
Factor 1×2	ns	*	ns	-

Means followed by different superscript letters within a column are significantly different (P≤0.05)

\* = significant

ns = non significant

**Table A.19** Alcohol dehydrogenase (units/min/mg protein) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)			
	0	10	25	43
<b>Factor 1 : Storage temperature</b>				
5°C	2.43±0.14	64.28±46.79 <sup>a</sup>	14.87±7.70 <sup>b</sup>	16.83±10.67
10°C	2.43±0.14	21.30±25.39 <sup>b</sup>	23.64±4.06 <sup>a</sup>	-
Room temperature	2.43±0.14	6.51±2.55 <sup>b</sup>	-	-
<b>Factor 2 : Coating materials</b>				
Citrashine	2.43±0.15	46.99±34.05 <sup>a</sup>	24.57±15.44 <sup>b</sup>	23.86±17.77 <sup>b</sup>
Sealkote	2.43±0.15	28.68±20.49 <sup>ab</sup>	16.84±12.12 <sup>b</sup>	4.60±1.16 <sup>c</sup>
Rosy Plus	2.43±0.15	26.14±23.37 <sup>ab</sup>	12.88±5.19 <sup>b</sup>	16.12±9.63 <sup>bc</sup>
Zivdar	2.43±0.15	39.66±16.12 <sup>ab</sup>	4.87±5.28 <sup>b</sup>	16.60±13.67 <sup>bc</sup>
Perfect Shine	2.43±0.15	47.05±13.18 <sup>a</sup>	11.81±10.19 <sup>b</sup>	3.04±1.54 <sup>c</sup>
PE microemulsion	2.43±0.15	24.63±13.58 <sup>b</sup>	17.14±13.91 <sup>b</sup>	2.52±1.16 <sup>c</sup>
2.0% chitosan	2.43±0.15	27.96±17.06 <sup>ab</sup>	9.84±7.90 <sup>b</sup>	5.98±1.56 <sup>c</sup>
non-coated	2.43±0.15	14.46±12.32 <sup>b</sup>	56.10±11.46 <sup>b</sup>	61.87±14.14 <sup>a</sup>
Factor 1	ns	*	*	-
Factor 2	ns	*	*	-
Factor 1×2	ns	*	*	-

Means followed by different superscript letters within a column are significantly different (P≤0.05)

\* = significant ns = non significant

**Table A.20** Flavor score of tangerine fruit cv. ‘Sai Nam Phueng’ coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)									
	0	4	7	10	13	16	19	22		
<b>Factor 1 : Storage temperature</b>										
5°C	4.00±0.00	4.00±0.00 <sup>a</sup>	3.94±0.25 <sup>a</sup>	3.88±0.34 <sup>a</sup>	3.94±0.25 <sup>a</sup>	3.94±0.25 <sup>a</sup>	3.81±0.51	3.75±0.67 <sup>a</sup>		
10°C	4.00±0.00	4.00±0.00 <sup>a</sup>	3.88±0.34 <sup>a</sup>	3.81±0.40 <sup>a</sup>	3.63±0.71 <sup>b</sup>	3.63±0.49 <sup>b</sup>	3.75±0.76	2.94±1.37 <sup>b</sup>		
Room temperature	4.00±0.00	3.81±0.40 <sup>b</sup>	3.06±0.91 <sup>b</sup>	2.44±1.39 <sup>b</sup>	-	-	-	-		
<b>Factor 2 : Coating materials</b>										
Citrashine	4.00±0.00	3.67±0.49 <sup>b</sup>	3.00±0.85 <sup>d</sup>	2.33±0.98 <sup>c</sup>	3.50±0.53 <sup>b</sup>	3.50±0.53 <sup>b</sup>	2.50±1.20 <sup>b</sup>	1.50±0.53 <sup>d</sup>		
Sealkote	4.00±0.00	3.830.40 <sup>ab</sup>	3.50±0.80 <sup>bc</sup>	3.00±1.48 <sup>bc</sup>	3.00±1.07 <sup>c</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.00±1.31 <sup>bc</sup>		
Rosy Plus	4.00±0.00	4.00±0.00 <sup>a</sup>	3.50±0.80 <sup>bc</sup>	3.00±1.48 <sup>bc</sup>	3.75±0.46 <sup>ab</sup>	3.25±0.46 <sup>b</sup>	4.00±0.00 <sup>a</sup>	2.50±1.60 <sup>c</sup>		
Zivdar	4.00±0.00	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>		
Perfect Shine	4.00±0.00	4.00±0.00 <sup>a</sup>	3.17±0.94 <sup>cd</sup>	3.17±1.27 <sup>b</sup>	4.00±0.00 <sup>a</sup>	3.50±0.53 <sup>b</sup>	4.00±0.00 <sup>a</sup>	3.75±0.46 <sup>ab</sup>		
PE microemulsion	4.00±0.00	4.00±0.00 <sup>a</sup>	3.83±0.39 <sup>ab</sup>	3.50±0.52 <sup>ab</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>		
2.0% chitosan	4.00±0.00	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.75±0.46 <sup>a</sup>	4.00±0.00 <sup>a</sup>		
non-coated	4.00±0.00	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>		
Factor 1	ns	*	*	*	*	*	ns	*		
Factor 2	ns	*	*	*	*	*	*	*		
Factor 1×2	ns	*	*	*	*	*	ns	*		

Means followed by different superscript letters within a column are significantly different (P≤0.05) \* = significant ns = non significant

Evaluation of flavor by tasting, using a scale of 1 to 4 where 4 = excellent, 3 = slightly off-flavor, 2 = moderately off-flavor and 1 = extremely off-flavor. Fruit taste was rated “unacceptable” when the taste score was below three.

**Table A.20 (continued)** Flavor score of tangerine fruit cv. ‘Sai Nam Phueng’ coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)						
	25	28	31	34	37	40	43
<b>Factor 1 : Storage temperature</b>							
5°C	3.63±1.01 <sup>a</sup>	3.69±0.78 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.81±0.40 <sup>a</sup>	3.63±1.01 <sup>b</sup>	3.63±1.01	3.50±0.72
10°C	3.38±1.07 <sup>b</sup>	3.31±1.12 <sup>b</sup>	3.63±1.10 <sup>b</sup>	3.38±1.01 <sup>b</sup>	3.88±0.34 <sup>a</sup>	-	-
Room temperature	-	-	-	-	-	-	-
<b>Factor 2 : Coating materials</b>							
Citrashine	1.00±0.00 <sup>c</sup>	1.50±0.93 <sup>c</sup>	2.50±1.60 <sup>b</sup>	2.25±1.39 <sup>c</sup>	2.00±1.07 <sup>b</sup>	1.00±0.00 <sup>b</sup>	2.00±0.00 <sup>c</sup>
Sealkote	4.00±0.00 <sup>a</sup>	3.50±0.93 <sup>ab</sup>	4.00±0.00 <sup>a</sup>	3.50±0.53 <sup>ab</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.00±0.00 <sup>b</sup>
Rosy Plus	3.25±0.89 <sup>b</sup>	3.00±0.76 <sup>b</sup>	4.00±0.00 <sup>a</sup>	3.00±0.00 <sup>b</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.00±0.00 <sup>b</sup>
Zivdar	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>
Perfect Shine	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>
PE microemulsion	3.75±0.46 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>
2.0% chitosan	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>
non-coated	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>
Factor 1	*	*	*	*	*	-	-
Factor 2	*	*	*	*	*	-	-
Factor 1×2	*	*	*	*	*	-	-

Means followed by different superscript letters within a column are significantly different ( $P \leq 0.05$ ) \* = significant ns = non significant

Evaluation of flavor by tasting, using a scale of 1 to 4 where 4 = excellent, 3 = slightly off-flavor, 2 = moderately off-flavor and 1 = extremely off-flavor. Fruit taste was rated “unacceptable” when the taste score was below three.

**Table A.21** Visual appearance score of tangerine fruit cv. ‘Sai Nam Phueng’ coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)									
	0	4	7	10	13	16	19	22		
<b>Factor 1 : Storage temperature</b>										
5°C	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	4.94±0.25 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.75±0.44 <sup>b</sup>	4.75±0.44 <sup>b</sup>	4.75±0.44 <sup>b</sup>	4.94±0.25 <sup>a</sup>
10°C	5.00±0.00	5.00±0.00	4.88±0.34 <sup>a</sup>	4.69±0.47 <sup>a</sup>	4.56±5.50 <sup>b</sup>	4.88±0.34 <sup>b</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>
Room temperature	5.00±0.00	5.00±0.00	4.13±1.34 <sup>b</sup>	2.56±1.29 <sup>b</sup>	-	-	-	-	-	-
<b>Factor 2 : Coating materials</b>										
Citrashine	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	4.67±0.49 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>
Sealkote	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	4.17±0.94 <sup>abc</sup>	4.75±0.46 <sup>ab</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>
Rosy Plus	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	4.33±1.15 <sup>ab</sup>	4.75±0.46 <sup>ab</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>
Zivdar	5.00±0.00	5.00±0.00	4.50±0.80 <sup>ab</sup>	4.83±0.39 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>
Perfect Shine	5.00±0.00	5.00±0.00	4.83±0.39 <sup>a</sup>	4.00±1.48 <sup>abc</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>
PE microemulsion	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	3.83±1.40 <sup>abc</sup>	4.50±0.53 <sup>b</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>
2.0% chitosan	5.00±0.00	5.00±0.00	4.00±1.48 <sup>b</sup>	3.50±1.88 <sup>bc</sup>	4.75±0.46 <sup>ab</sup>	4.75±0.46 <sup>b</sup>	4.75±0.53 <sup>b</sup>	4.75±0.53 <sup>b</sup>	4.75±0.53 <sup>b</sup>	4.75±0.53 <sup>b</sup>
non-coated	5.00±0.00	5.00±0.00	4.00±1.48 <sup>b</sup>	3.17±1.64 <sup>c</sup>	4.50±0.53 <sup>b</sup>	4.75±0.46 <sup>b</sup>	4.50±0.53 <sup>b</sup>	4.50±0.53 <sup>b</sup>	4.50±0.53 <sup>b</sup>	4.25±0.46 <sup>b</sup>
Factor 1	ns	ns	*	*	*	*	*	*	*	*
Factor 2	ns	ns	*	*	*	*	*	*	*	*
Factor 1×2	ns	ns	*	*	*	*	*	*	*	*

Means followed by different superscript letters within a column are significantly different ( $P \leq 0.05$ )

\* = significant ns = non significant

Evaluation of visual appearance (wilting and shriveling), using a scale of 1 to 5 where 5 = excellent, 4 = good, 3 = fair, 2 = poor and 1 = unusable. Fruit appearance was rated “unacceptable” when the score was below three.



**Table A.21 (continued)** Visual appearance score of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)						
	25	28	31	34	37	40	43
<b>Factor 1 : Storage temperature</b>							
5°C	4.63±0.71 <sup>b</sup>	4.25±1.32 <sup>b</sup>	4.50±0.51 <sup>b</sup>	3.50±0.95 <sup>b</sup>	4.06±0.56 <sup>b</sup>	3.50±1.24	3.50±1.57
10°C	4.81±0.40 <sup>a</sup>	4.94±0.25 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.75±0.44 <sup>a</sup>	-	-
Room temperature	-	-	-	-	-	-	-
<b>Factor 2 : Coating materials</b>							
Citrashine	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.50±0.53 <sup>a</sup>	4.00±0.00 <sup>b</sup>	4.50±0.58 <sup>ab</sup>
Sealkote	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.25±0.89 <sup>abc</sup>	4.50±0.53 <sup>a</sup>	4.00±0.00 <sup>b</sup>	4.50±0.58 <sup>ab</sup>
Rosy Plus	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.25±0.89 <sup>abc</sup>	4.75±0.46 <sup>a</sup>	4.00±0.00 <sup>b</sup>	4.00±0.00 <sup>bc</sup>
Zivdar	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.50±.93 <sup>ab</sup>	4.75±0.46 <sup>a</sup>	4.00±0.00 <sup>b</sup>	4.50±0.58 <sup>ab</sup>
Perfect Shine	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.50±0.53 <sup>b</sup>	4.25±0.89 <sup>abc</sup>	4.50±0.53 <sup>a</sup>	4.00±0.00 <sup>b</sup>	3.50±0.58 <sup>c</sup>
PE microemulsion	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.50±0.53 <sup>b</sup>	4.25±0.89 <sup>abc</sup>	4.75±0.46 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>
2.0% chitosan	3.75±0.46 <sup>b</sup>	3.50±1.60 <sup>b</sup>	4.50±0.53 <sup>b</sup>	4.00±1.07 <sup>bc</sup>	3.75±0.46 <sup>b</sup>	1.50±0.58 <sup>c</sup>	1.00±0.00 <sup>d</sup>
non-coated	4.00±0.76 <sup>b</sup>	3.25±1.39 <sup>b</sup>	4.50±0.53 <sup>b</sup>	3.50±1.60 <sup>c</sup>	3.75±0.46 <sup>b</sup>	1.50±0.58 <sup>c</sup>	1.00±0.00 <sup>d</sup>
Factor 1	*	*	*	*	*	-	-
Factor 2	*	*	*	*	*	-	-
Factor 1×2	*	*	*	*	*	-	-

Means followed by different superscript letters within a column are significantly different (P≤0.05)

\* = significant

ns = non significant

Evaluation of visual appearance (wilting and shriveling), using a scale of 1 to 5 where 5 = excellent, 4 = good, 3 = fair, 2 = poor and 1 = unusable. Fruit appearance was rated "unacceptable" when the score was below three.

**Table A.22** L\* of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)									
	0	4	7	10	13	16	19	22		
<b>Factor 1 : Storage temperature</b>										
5°C	64.63±2.17	65.23±1.77 <sup>a</sup>	63.69±1.79 <sup>b</sup>	63.52±1.75 <sup>a</sup>	63.30±1.80 <sup>b</sup>	62.63±1.89	63.27±1.69	63.15±1.70		
10°C	63.80±3.20	64.43±2.15 <sup>ab</sup>	63.82±2.22 <sup>b</sup>	63.43±1.73 <sup>b</sup>	63.68±1.98 <sup>ab</sup>	63.21±2.04	63.11±1.86	62.92±1.90		
Room temperature	63.90±2.75	63.74±1.68 <sup>b</sup>	64.81±1.86 <sup>a</sup>	64.40±1.99 <sup>a</sup>	64.29±1.90 <sup>a</sup>	-	-	-		
<b>Factor 2 : Coating materials</b>										
Citrahshine	63.60±3.35	63.87±2.31	63.72±2.57	62.91±2.26	63.21±2.02	62.44±2.16	62.94±2.08	62.63±2.46		
Sealkote	63.83±2.28	64.63±1.55	64.48±1.51	64.37±1.30	64.27±1.80	62.92±1.89	63.58±1.58	63.73±1.75		
Rosy Plus	62.80±4.14	63.42±1.87	62.92±1.85	63.14±1.24	63.12±1.43	62.31±1.76	62.73±1.56	62.55±1.47		
Zivdar	64.70±2.03	65.56±2.15	65.43±2.21	65.14±1.85	65.01±2.33	63.52±2.13	64.04±2.21	64.22±2.05		
Perfect Shine	63.22±2.32	64.21±1.63	63.84±1.57	63.44±1.81	63.51±2.01	62.51±1.86	62.83±1.38	62.74±0.90		
PE microemulsion	65.15±2.35	64.93±1.72	64.48±2.29	64.30±2.06	63.92±2.23	63.35±3.00	63.56±2.50	63.23±2.44		
2.0% chitosan	64.68±2.18	64.26±2.22	63.69±1.86	63.12±1.81	63.30±1.68	63.10±1.87	62.98±1.26	62.46±1.30		
non-coated	64.91±2.39	64.84±1.77	64.29±1.53	63.86±1.68	63.72±1.42	63.14±1.27	62.85±1.56	62.68±1.45		
Factor 1	ns	*	*	*	*	ns	ns	ns	ns	ns
Factor 2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Factor 1×2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns

Means followed by different superscript letters within a column are significantly different (P≤0.05) \* = significant ns = non significant

**Table A.22 (continued)** L\* of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)						
	25	28	31	34	37	40	43
<b>Factor 1 : Storage temperature</b>							
5°C	62.87±1.66	62.70±1.63	62.77±1.44	62.26±2.37	62.04±1.77	62.66±1.57	61.86±1.62
10°C	62.31±1.89	62.08±1.88	-	-	-	-	-
Room temperature	-	-	-	-	-	-	-
<b>Factor 2 : Coating materials</b>							
Citrashine	62.31±2.33	62.16±2.34	62.84±0.64	62.61±0.61	62.23±0.99	62.88±0.39	61.89±0.55
Sealkote	63.27±1.54	63.13±1.47	63.47±0.88	63.07±0.88	62.51±1.15	63.02±1.12	61.67±1.70
Rosy Plus	62.11±0.85	62.23±1.22	62.49±1.68	61.66±2.39	60.57±2.21	62.35±1.83	61.41±1.51
Zivdar	63.60±2.36	63.50±2.12	63.84±1.62	63.71±1.76	63.58±2.14	64.00±2.10	63.27±2.11
Perfect Shine	62.17±1.08	61.89±0.81	62.10±0.38	59.64±4.72	61.33±0.70	6.19±0.83	61.38±0.60
PE microemulsion	62.91±2.29	62.45±2.56	63.36±2.61	63.46±2.75	63.54±2.15	63.25±2.91	62.69±3.06
2.0% chitosan	62.20±1.45	61.85±1.36	61.20±0.98	61.34±1.10	60.36±1.12	61.20±0.69	60.60±1.03
non-coated	62.15±1.91	61.92±1.68	62.85±0.42	62.63±0.59	62.20±0.58	62.60±0.29	62.00±0.44
Factor 1	ns	ns	-	-	-	-	-
Factor 2	ns	ns	-	-	-	-	-
Factor 1×2	ns	ns	-	-	-	-	-

Means followed by different superscript letters within a column are significantly different (P≤0.05)

\* = significant

ns = non significant

**Table A.23** Chroma of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)									
	0	4	7	10	13	16	19	22		
<b>Factor 1 : Storage temperature</b>										
5°C	63.55±3.00	64.70±3.27 <sup>b</sup>	68.89±4.10 <sup>a</sup>	69.47±2.90 <sup>a</sup>	68.44±3.75 <sup>a</sup>	66.99±3.16	68.26±3.22 <sup>a</sup>	68.05±3.05		
10°C	63.27±3.60	66.34±3.96 <sup>b</sup>	69.31±3.60 <sup>a</sup>	68.79±2.84 <sup>a</sup>	66.64±3.18 <sup>b</sup>	66.65±2.42	65.73±3.53 <sup>b</sup>	67.04±3.18		
Room temperature	63.80±3.46	68.61±3.34 <sup>a</sup>	64.54±3.26 <sup>b</sup>	64.38±3.17 <sup>b</sup>	63.61±3.31 <sup>c</sup>	-	-	-		
<b>Factor 2 : Coating materials</b>										
Citrashine	61.54±3.49 <sup>de</sup>	64.86±4.59 <sup>bc</sup>	64.67±4.49 <sup>cd</sup>	64.82±4.17 <sup>c</sup>	63.58±3.46 <sup>de</sup>	65.14±2.76 <sup>cd</sup>	63.89±4.28 <sup>c</sup>	65.30±3.61 <sup>cd</sup>		
Sealkote	63.46±2.28 <sup>bcd</sup>	66.24±2.49 <sup>b</sup>	67.48±2.98 <sup>bc</sup>	68.28±2.93 <sup>ab</sup>	66.15±2.86 <sup>bcd</sup>	66.23±2.46 <sup>bcd</sup>	67.03±1.83 <sup>b</sup>	67.26±2.37 <sup>bc</sup>		
Rosy Plus	60.80±3.40 <sup>e</sup>	63.13±3.12 <sup>c</sup>	63.49±3.60 <sup>d</sup>	65.98±3.71 <sup>bc</sup>	63.19±3.11 <sup>e</sup>	64.16±1.95 <sup>d</sup>	63.45±1.85 <sup>c</sup>	64.11±1.81 <sup>d</sup>		
Zivdar	64.55±1.88 <sup>abc</sup>	67.24±3.42 <sup>b</sup>	68.20±3.15 <sup>b</sup>	67.99±3.06 <sup>ab</sup>	66.32±3.21 <sup>bcd</sup>	67.75±1.64 <sup>ab</sup>	67.49±2.78 <sup>b</sup>	68.13±2.17 <sup>b</sup>		
Perfect Shine	62.46±3.31 <sup>cde</sup>	66.52±2.22 <sup>b</sup>	67.76±3.74 <sup>b</sup>	67.32±3.81 <sup>bc</sup>	65.06±4.23 <sup>cde</sup>	67.21±2.81 <sup>abc</sup>	66.93±3.58 <sup>b</sup>	67.96±2.92 <sup>b</sup>		
PE microemulsion	65.00±3.05 <sup>ab</sup>	66.54±3.48 <sup>b</sup>	68.74±3.62 <sup>b</sup>	68.30±3.73 <sup>ab</sup>	67.23±4.23 <sup>bc</sup>	66.61±2.55 <sup>bcd</sup>	66.97±3.23 <sup>b</sup>	66.88±2.45 <sup>bc</sup>		
2.0% chitosan non-coated	64.13±2.85 <sup>abc</sup>	67.08±3.27 <sup>b</sup>	68.35±3.28 <sup>b</sup>	67.34±2.88 <sup>bc</sup>	68.00±2.76 <sup>ab</sup>	68.08±2.05 <sup>ab</sup>	69.03±1.51 <sup>ab</sup>	69.19±1.81 <sup>ab</sup>		
	66.33±3.04 <sup>a</sup>	70.81±3.88 <sup>a</sup>	71.95±3.72 <sup>a</sup>	70.34±3.52 <sup>a</sup>	70.31±3.54 <sup>a</sup>	69.20±3.31 <sup>a</sup>	70.93±3.34 <sup>a</sup>	71.34±2.21 <sup>a</sup>		
Factor 1	ns	*	*	*	*	ns	*	ns		
Factor 2	*	*	*	*	*	*	*	*		
Factor 1×2	ns	ns	ns	ns	ns	ns	*	ns		

Means followed by different superscript letters within a column are significantly different (P≤0.05)

\* = significant

ns = non significant

**Table A.23 (continued)** Chroma of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)						
	25	28	31	34	37	40	43
<b>Factor 1 : Storage temperature</b>							
5°C	68.66±2.76	68.32±2.89	68.27±2.87	67.36±2.93	66.71±3.49	64.09±3.65	67.76±2.46
10°C	68.55±4.12	67.31±3.25	-	-	-	-	-
Room temperature	-	-	-	-	-	-	-
<b>Factor 2 : Coating materials</b>							
Citrashine	65.38±4.26 <sup>d</sup>	65.11±3.56 <sup>cd</sup>	66.73±1.79 <sup>bc</sup>	66.24±1.56 <sup>bc</sup>	65.14±2.13 <sup>c</sup>	65.41±2.13 <sup>cd</sup>	66.91±1.09 <sup>bc</sup>
Sealkote	67.75±1.44 <sup>cd</sup>	67.23±2.25 <sup>bed</sup>	68.45±0.73 <sup>b</sup>	66.65±1.03 <sup>b</sup>	66.85±1.15 <sup>bc</sup>	63.44±1.74 <sup>b</sup>	67.16±2.21 <sup>bc</sup>
Rosy Plus	65.52±1.97 <sup>d</sup>	64.97±2.40 <sup>d</sup>	64.65±4.75 <sup>c</sup>	63.26±1.94 <sup>c</sup>	60.87±3.54 <sup>d</sup>	60.09±2.80 <sup>d</sup>	65.69±2.68 <sup>c</sup>
Zivdar	68.70±3.75 <sup>bc</sup>	69.03±2.13 <sup>ab</sup>	69.07±1.28 <sup>ab</sup>	68.41±0.65 <sup>b</sup>	68.36±1.22 <sup>b</sup>	65.68±1.52 <sup>ab</sup>	68.99±1.45 <sup>ab</sup>
Perfect Shine	68.17±2.58 <sup>bed</sup>	67.84±3.05 <sup>b</sup>	67.74±1.98 <sup>bc</sup>	67.30±2.69 <sup>b</sup>	66.01±2.73 <sup>bc</sup>	63.38±2.42 <sup>bc</sup>	67.13±1.56 <sup>bc</sup>
PE microemulsion	69.70±2.48 <sup>bc</sup>	67.55±2.93 <sup>bc</sup>	68.77±2.57 <sup>b</sup>	66.69±3.57 <sup>b</sup>	68.10±2.49 <sup>bc</sup>	66.58±3.69 <sup>ab</sup>	66.52±3.12 <sup>bc</sup>
2.0% chitosan non-coated	70.66±2.43 <sup>ab</sup>	69.38±1.72 <sup>ab</sup>	68.49±0.75 <sup>b</sup>	68.53±2.14 <sup>b</sup>	66.76±1.81 <sup>bc</sup>	65.24±1.66 <sup>b</sup>	68.35±1.58 <sup>bc</sup>
	72.54±2.44 <sup>a</sup>	71.13±2.19 <sup>a</sup>	72.29±1.58 <sup>a</sup>	71.77±1.25 <sup>a</sup>	71.62±1.20 <sup>a</sup>	68.89±1.31 <sup>a</sup>	71.37±1.73 <sup>a</sup>
Factor 1	ns	ns	-	-	-	-	-
Factor 2	*	*	-	-	-	-	-
Factor 1×2	*	ns	-	-	-	-	-

Means followed by different superscript letters within a column are significantly different (P≤0.05)

\* = significant

ns = non significant

**Table A.24** Hue angle (degree) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)									
	0	4	7	10	13	16	19	22		
<b>Factor 1 : Storage temperature</b>										
5°C	77.64±3.09 <sup>a</sup>	75.18±2.72	76.18±3.01	75.78±2.91 <sup>a</sup>	75.70±2.85 <sup>a</sup>	75.56±3.01 <sup>a</sup>	75.56±2.88 <sup>a</sup>	75.43±3.07 <sup>a</sup>		
10°C	75.90±3.40 <sup>b</sup>	75.14±3.18	75.30±3.06	74.54±3.60 <sup>ab</sup>	73.96±3.02 <sup>b</sup>	73.44±2.98 <sup>b</sup>	72.73±2.90 <sup>b</sup>	72.24±2.90 <sup>b</sup>		
Room temperature	76.79±2.74 <sup>ab</sup>	76.15±2.91	74.75±2.80	74.05±2.69 <sup>b</sup>	73.52±2.68 <sup>b</sup>	-	-	-		
<b>Factor 2 : Coating materials</b>										
Citrashine	77.16±3.17 <sup>abc</sup>	75.93±3.19 <sup>abc</sup>	75.83±3.37 <sup>abc</sup>	75.79±3.34 <sup>abc</sup>	74.94±3.27 <sup>ab</sup>	75.64±3.78 <sup>ab</sup>	74.91±4.05 <sup>abc</sup>	75.00±4.11 <sup>abc</sup>		
Sealkote	78.49±2.68 <sup>a</sup>	77.13±2.92 <sup>ab</sup>	77.09±2.77 <sup>ab</sup>	76.63±2.86 <sup>a</sup>	76.43±3.01 <sup>a</sup>	76.99±2.12 <sup>a</sup>	76.70±2.28 <sup>a</sup>	76.64±2.55 <sup>a</sup>		
Rosy Plus	77.66±3.24 <sup>ab</sup>	75.39±3.20 <sup>abc</sup>	75.21±3.16 <sup>bc</sup>	74.32±3.27 <sup>ab</sup>	74.32±3.27 <sup>ab</sup>	76.21±3.02 <sup>ab</sup>	75.70±3.03 <sup>ab</sup>	75.65±3.07 <sup>ab</sup>		
Zivdar	78.40±2.62 <sup>a</sup>	77.47±2.65 <sup>a</sup>	77.80±2.69 <sup>a</sup>	76.33±2.47 <sup>a</sup>	76.33±2.47 <sup>a</sup>	76.18±2.57 <sup>ab</sup>	75.59±2.93 <sup>ab</sup>	74.95±3.60 <sup>abc</sup>		
Perfect Shine	76.41±1.69 <sup>abc</sup>	74.85±1.93 <sup>bc</sup>	74.73±1.76 <sup>c</sup>	73.69±1.69 <sup>b</sup>	73.69±1.69 <sup>b</sup>	73.86±1.33 <sup>bc</sup>	73.49±1.33 <sup>bc</sup>	73.10±1.42 <sup>bcd</sup>		
PE microemulsion	75.83±3.12 <sup>bc</sup>	74.59±2.77 <sup>c</sup>	74.53±2.86 <sup>c</sup>	73.59±2.96 <sup>b</sup>	73.59±2.96 <sup>b</sup>	72.40±2.98 <sup>c</sup>	72.06±3.26 <sup>c</sup>	71.74±3.43 <sup>d</sup>		
2.0% chitosan	74.88±3.67 <sup>c</sup>	74.33±3.11 <sup>c</sup>	74.13±2.92 <sup>c</sup>	73.04±2.73 <sup>b</sup>	73.04±2.73 <sup>b</sup>	72.88±2.88 <sup>c</sup>	72.94±2.97 <sup>bc</sup>	72.21±2.86 <sup>cd</sup>		
non-coated	75.39±3.19 <sup>bc</sup>	74.25±2.51 <sup>c</sup>	73.92±2.41 <sup>c</sup>	72.78±2.43 <sup>b</sup>	72.78±2.43 <sup>b</sup>	72.13±2.65 <sup>c</sup>	72.04±2.67 <sup>c</sup>	71.76±2.56 <sup>d</sup>		
Factor 1	*	ns	ns	*	*	*	*	*		
Factor 2	*	*	*	*	*	*	*	*		
Factor 1×2	ns	ns	ns	ns	ns	ns	ns	ns		

Means followed by different superscript letters within a column are significantly different (P≤0.05)

\* = significant

ns = non significant

**Table A.24 (continued)** Hue angle (degree) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)						
	25	28	31	34	37	40	43
<b>Factor 1 : Storage temperature</b>							
5°C	75.28±3.00 <sup>a</sup>	75.03±2.90 <sup>a</sup>	74.96±2.86	74.86±2.92	74.69±2.85	74.97±2.97	74.56±3.02
10°C	71.96±2.78 <sup>b</sup>	71.03±2.85 <sup>b</sup>	-	-	-	-	-
Room temperature	-	-	-	-	-	-	-
<b>Factor 2 : Coating materials</b>							
Citrashine	74.69±3.86 <sup>abc</sup>	74.40±3.88 <sup>abc</sup>	75.25±1.99 <sup>abc</sup>	75.45±1.98 <sup>abcd</sup>	75.10±2.09 <sup>ab</sup>	75.13±2.15 <sup>abc</sup>	75.50±1.87 <sup>abc</sup>
Sealkote	76.10±2.59 <sup>a</sup>	75.83±2.86 <sup>a</sup>	77.05±2.23 <sup>ab</sup>	77.08±2.64 <sup>ab</sup>	76.98±2.46 <sup>a</sup>	77.75±2.00 <sup>a</sup>	77.48±1.96 <sup>a</sup>
Rosy Plus	75.43±3.16 <sup>ab</sup>	74.96±3.24 <sup>ab</sup>	77.20±2.73 <sup>a</sup>	77.50±1.99 <sup>a</sup>	77.58±1.50 <sup>a</sup>	77.75±2.38 <sup>a</sup>	77.38±2.07 <sup>a</sup>
Zivdar	74.53±3.88 <sup>abc</sup>	73.79±4.18 <sup>abcd</sup>	77.35±1.84 <sup>a</sup>	76.93±2.06 <sup>abc</sup>	76.78±1.73 <sup>a</sup>	76.88±1.90 <sup>ab</sup>	76.08±2.14 <sup>ab</sup>
Perfect Shine	72.93±1.59 <sup>bc</sup>	72.21±1.86 <sup>bcd</sup>	73.73±1.40 <sup>bc</sup>	73.55±1.39 <sup>cd</sup>	73.25±1.14 <sup>b</sup>	73.43±1.53 <sup>c</sup>	73.15±1.44 <sup>bcd</sup>
PE microemulsion	71.83±3.31 <sup>c</sup>	71.11±3.60 <sup>d</sup>	74.18±2.84 <sup>abc</sup>	73.78±3.03 <sup>bcd</sup>	73.48±2.75 <sup>b</sup>	74.25±2.98 <sup>bc</sup>	73.43±2.89 <sup>bcd</sup>
2.0% chitosan	72.11±2.91 <sup>c</sup>	71.38±2.66 <sup>cd</sup>	72.13±2.57 <sup>c</sup>	72.00±2.71 <sup>d</sup>	72.33±2.76 <sup>b</sup>	72.30±2.69 <sup>c</sup>	71.30±2.63 <sup>d</sup>
non-coated	71.69±2.75 <sup>c</sup>	70.99±2.72 <sup>d</sup>	72.83±2.91 <sup>c</sup>	72.63±2.68 <sup>d</sup>	72.08±2.53 <sup>b</sup>	72.30±2.47 <sup>c</sup>	72.18±2.88 <sup>cd</sup>
Factor 1	*	*	-	-	-	-	-
Factor 2	*	*	-	-	-	-	-
Factor 1×2	ns	ns	-	-	-	-	-

Means followed by different superscript letters within a column are significantly different (P≤0.05)

\* = significant

ns = non significant

**Table A.25** Total soluble solids (%) of tangerine fruit cv. ‘Sai Nam Phung’ coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)			
	0	10	25	43
<b>Factor 1 : Storage temperature</b>				
5°C	13.00±0.36	12.59±1.49 <sup>b</sup>	14.02±0.77	14.08±1.03
10°C	13.00±0.36	13.04±1.22 <sup>b</sup>	14.11±0.61	-
Room temperature	13.00±0.36	14.25±0.72 <sup>a</sup>	-	-
<b>Factor 2 : Coating materials</b>				
Citrashine	13.70±0.38	13.46±1.68	14.43±0.65	13.37±0.51 <sup>b</sup>
Sealkote	13.70±0.38	13.40±1.39	14.18±0.30	13.53±0.68 <sup>b</sup>
Rosy Plus	13.70±0.38	13.38±1.32	13.50±0.58	14.03±0.47 <sup>b</sup>
Zivdar	13.70±0.38	13.48±1.11	13.90±0.50	13.83±1.27 <sup>b</sup>
Perfect Shine	13.70±0.38	12.63±1.78	13.77±0.67	14.17±0.78 <sup>b</sup>
PE microemulsion	13.70±0.38	13.23±1.23	14.27±0.72	13.80±0.78 <sup>b</sup>
2.0% chitosan	13.70±0.38	12.84±1.62	13.85±0.92	13.80±0.17 <sup>b</sup>
non-coated	13.70±0.38	13.94±0.51	14.62±0.58	16.10±0.87 <sup>a</sup>
Factor 1	ns	*	ns	-
Factor 2	ns	ns	ns	-
Factor 1×2	ns	ns	ns	-

Means followed by different superscript letters within a column are significantly different (P≤0.05)

\* = significant

ns = non significant



**Table A.26** Titratable acidity (%) of tangerine fruit cv. ‘Sai Nam Phueng’ coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)			
	0	10	25	43
<b>Factor 1 : Storage temperature</b>				
5°C	0.78±0.01	0.66±0.10	0.68±0.11	0.63±0.09
10°C	0.78±0.01	0.71±0.08	0.73±0.12	-
Room temperature	0.78±0.01	0.71±0.14	-	-
<b>Factor 2 : Coating materials</b>				
Citrashine	0.78±0.01	0.70±0.12	0.74±0.15	0.65±0.11
Sealkote	0.78±0.01	0.75±0.17	0.70±0.13	0.60±0.05
Rosy Plus	0.78±0.01	0.71±0.10	0.66±0.07	0.70±0.03
Zivdar	0.78±0.01	0.66±0.12	0.69±0.09	0.68±0.12
Perfect Shine	0.78±0.01	0.64±0.05	0.71±0.13	0.56±0.08
PE microemulsion	0.78±0.01	0.65±0.09	0.73±0.09	0.64±0.06
2.0% chitosan	0.78±0.01	0.70±0.07	0.69±0.07	0.55±0.07
non-coated	0.78±0.01	0.71±0.11	0.72±0.20	0.69±0.06
Factor 1	ns	ns	ns	-
Factor 2	ns	ns	ns	-
Factor 1×2	ns	ns	ns	-

Means followed by different superscript letters within a column are significantly different ( $P \leq 0.05$ )

\* = significant

ns = non significant

**Table A.27** TSS/TA ratio of tangerine fruit cv. ‘Sai Nam Phueng’ coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)			
	0	10	25	43
<b>Factor 1 : Storage temperature</b>				
5°C	17.64±0.76	19.53±3.82	20.91±2.81	22.55±3.01
10°C	17.64±0.76	18.53±2.65	19.84±2.91	-
Room temperature	17.64±0.76	20.65±4.06	-	-
<b>Factor 2 : Coating materials</b>				
Citrashine	17.64±0.79	19.75±4.34	20.12±3.57	21.13±3.91
Sealkote	17.64±0.79	18.68±4.07	20.60±3.19	22.46±1.55
Rosy Plus	17.64±0.79	19.05±2.52	20.65±2.07	20.03±0.13
Zivdar	17.64±0.79	21.07±5.74	20.48±2.25	20.41±1.85
Perfect Shine	17.64±0.79	19.78±2.12	19.71±2.68	25.73±3.84
PE microemulsion	17.64±0.79	20.59±3.53	19.71±2.41	21.85±2.67
2.0% chitosan	17.64±0.79	18.61±3.32	20.32±2.09	25.51±2.87
non-coated	17.64±0.79	19.04±2.69	21.41±5.07	23.28±2.01
Factor 1	ns	ns	ns	-
Factor 2	ns	ns	ns	-
Factor 1×2	ns	ns	ns	-

Means followed by different superscript letters within a column are significantly different (P≤0.05)

\* = significant

ns = non significant

**Table A.28** pH of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)			
	0	10	25	43
<b>Factor 1 : Storage temperature</b>				
5°C	3.74±0.03	3.56±0.10	3.46±0.10	3.53±0.13
10°C	3.74±0.03	3.53±0.10	3.46±0.10	-
Room temperature	3.74±0.03	3.53±0.18	-	-
<b>Factor 2 : Coating materials</b>				
Citrashine	3.74±0.03	3.54±0.09	3.41±0.15	3.53±0.17
Sealkote	3.74±0.03	3.45±0.20	3.46±0.08	3.54±0.07
Rosy Plus	3.74±0.03	3.50±0.12	3.47±0.07	3.34±0.07
Zivdar	3.74±0.03	3.61±0.16	3.45±0.07	3.53±0.13
Perfect Shine	3.74±0.03	3.59±0.07	3.46±0.05	3.56±0.18
PE microemulsion	3.74±0.03	3.58±0.09	3.47±0.05	3.55±0.06
2.0% chitosan	3.74±0.03	3.52±0.08	3.46±0.08	3.59±0.07
non-coated	3.74±0.03	3.52±0.11	3.48±0.18	3.62±0.12
Factor 1	ns	ns	ns	-
Factor 2	ns	ns	ns	-
Factor 1×2	ns	ns	ns	-

Means followed by different superscript letters within a column are significantly different (P≤0.05)

\* = significant

ns = non significant

**Table A.29** Vitamin C (mg/100 ml juice) of tangerine fruit cv. 'Sai Nam Phueng' coated with coating materials during storage at 5, 10°C and room temperature for 43 days

Treatments	Storage time (days)			
	0	10	25	43
<b>Factor 1 : Storage temperatures</b>				
5°C	14.67±0.96	17.99±1.99	18.75±2.18	15.56±1.97
10°C	14.67±0.96	18.52±2.11	17.93±2.01	-
Room temperature	14.67±0.96	17.53±1.70	-	-
<b>Factor 2 : Coating materials</b>				
Citrashine	14.67±1.00	18.29±2.42	18.09±1.49	16.88±1.88
Sealkote	14.67±1.00	18.29±1.83	18.75±2.72	15.63±1.08
Rosy Plus	14.67±1.00	18.29±0.91	18.09±0.81	16.25±2.17
Zivdar	14.67±1.00	17.68±2.24	17.11±2.04	17.50±2.86
Perfect Shine	14.67±1.00	18.09±1.43	18.09±1.49	16.25±2.17
PE microemulsion	14.67±1.00	17.89±2.38	18.09±1.49	16.25±1.08
2.0% chitosan	14.67±1.00	19.11±1.85	20.39±2.04	18.75±1.88
non-coated	14.67±1.00	16.46±1.83	18.09±3.40	15.00±1.88
Factor 1	ns	ns	ns	-
Factor 2	ns	ns	ns	-
Factor 1×2	ns	ns	ns	-

Means followed by different superscript letters within a column are significantly different (P≤0.05)

\* = significant

ns = non significant

**Table A.30** Weight loss (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	0.00±0.00	0.87±0.14 <sup>a</sup>	1.66±0.23 <sup>b</sup>	2.29±0.27 <sup>b</sup>	2.94±0.37 <sup>b</sup>	3.69±0.54 <sup>ab</sup>	4.29±0.51 <sup>b</sup>
Fomesa	0.00±0.00	0.70±0.10 <sup>b</sup>	1.38±0.19 <sup>c</sup>	1.90±0.28 <sup>c</sup>	2.51±0.36 <sup>c</sup>	3.07±0.54 <sup>c</sup>	3.68±0.54 <sup>c</sup>
Citrashine	0.00±0.00	0.83±0.11 <sup>a</sup>	1.57±0.18 <sup>b</sup>	2.17±0.23 <sup>b</sup>	2.77±0.27 <sup>bc</sup>	3.39±0.38 <sup>bc</sup>	4.01±0.43 <sup>bc</sup>
non-coated	0.00±0.00	0.88±0.23 <sup>a</sup>	1.86±0.43 <sup>a</sup>	2.56±0.63 <sup>a</sup>	3.30±0.85 <sup>a</sup>	4.04±1.02 <sup>a</sup>	4.80±1.21 <sup>a</sup>
LSD <sub>0.05</sub>	-	0.10	0.18	0.25	0.32	0.42	0.47
C.V. (%)	-	18.50	17.23	17.38	17.85	18.76	17.76

Means followed by different superscript letters within a column are significantly different (P≤0.05).

**Table A.30 (continued)** Weight loss (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	4.92±0.60 <sup>b</sup>	5.55±0.70 <sup>b</sup>	6.16±0.80 <sup>b</sup>	6.77±0.89 <sup>b</sup>	7.47±0.99 <sup>b</sup>	7.99±1.08 <sup>b</sup>	8.50±1.17 <sup>b</sup>
Fomesa	4.25±0.63 <sup>c</sup>	4.83±0.71 <sup>c</sup>	5.41±0.81 <sup>c</sup>	5.93±0.90 <sup>c</sup>	6.63±0.99 <sup>b</sup>	6.93±2.70 <sup>c</sup>	7.61±1.14 <sup>b</sup>
Citrashine	4.62±0.50 <sup>bc</sup>	5.33±0.83 <sup>bc</sup>	5.83±0.64 <sup>bc</sup>	6.38±0.70 <sup>bc</sup>	7.12±0.80 <sup>b</sup>	7.66±0.87 <sup>bc</sup>	8.18±0.93 <sup>b</sup>
non-coated	5.54±1.40 <sup>a</sup>	6.33±1.60 <sup>a</sup>	7.07±1.79 <sup>a</sup>	7.88±1.99 <sup>a</sup>	8.70±2.19 <sup>a</sup>	9.32±2.33 <sup>a</sup>	9.87±2.47 <sup>a</sup>
LSD <sub>0.05</sub>	0.54	0.65	0.70	0.78	0.86	1.20	0.10
C.V. (%)	17.83	18.70	18.08	18.24	18.15	24.25	18.15

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.31** Internal O<sub>2</sub> (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	15.58±0.84	9.50±0.93 <sup>b</sup>	9.77±1.76 <sup>b</sup>	9.01±3.14 <sup>b</sup>	8.13±1.29 <sup>b</sup>	8.64±2.20 <sup>b</sup>	8.02±1.80 <sup>b</sup>
Fomesa	15.58±0.84	5.36±3.16 <sup>c</sup>	3.13±1.51 <sup>c</sup>	4.54±1.64 <sup>c</sup>	5.49±2.78 <sup>bc</sup>	4.58±2.32 <sup>c</sup>	5.88±2.29 <sup>bc</sup>
Citrashine	15.58±0.84	2.73±1.09 <sup>d</sup>	3.76±1.87 <sup>c</sup>	2.07±0.80 <sup>c</sup>	4.18±1.63 <sup>c</sup>	2.64±0.97 <sup>d</sup>	2.07±0.34 <sup>c</sup>
non-coated	15.58±0.84	13.17±1.20 <sup>a</sup>	12.65±1.79 <sup>a</sup>	13.74±3.49 <sup>a</sup>	12.85±2.05 <sup>a</sup>	13.96±1.18 <sup>a</sup>	13.75±2.20 <sup>a</sup>
LSD <sub>0.05</sub>	1.12	2.12	2.33	3.56	3.09	2.41	4.64
C.V. (%)	5.38	20.25	23.69	34.25	26.33	23.54	43.59

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.31 (continued)** Internal O<sub>2</sub> (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	8.01±1.68 <sup>b</sup>	6.78±1.58 <sup>b</sup>	6.09±2.03 <sup>b</sup>	6.88±2.46 <sup>b</sup>	6.03±1.41 <sup>b</sup>	5.26±1.41 <sup>b</sup>	2.70±1.31 <sup>b</sup>
Fomesa	4.33±1.33 <sup>c</sup>	6.54±1.96 <sup>bc</sup>	3.18±1.76 <sup>c</sup>	2.09±1.69 <sup>c</sup>	3.12±1.14 <sup>c</sup>	2.08±1.16 <sup>c</sup>	1.88±0.73 <sup>b</sup>
Citrashine	2.07±0.47 <sup>d</sup>	2.69±1.23 <sup>c</sup>	1.98±0.96 <sup>c</sup>	2.46±1.54 <sup>c</sup>	2.70±1.27 <sup>c</sup>	2.38±0.78 <sup>c</sup>	1.97±0.84 <sup>b</sup>
non-coated	12.23±1.42 <sup>a</sup>	12.90±1.96 <sup>a</sup>	13.03±1.17 <sup>a</sup>	12.93±1.77 <sup>a</sup>	13.15±0.93 <sup>a</sup>	13.19±1.47 <sup>a</sup>	11.50±0.70 <sup>a</sup>
LSD <sub>0.05</sub>	1.93	2.29	2.09	3.81	3.11	2.74	1.25
C.V. (%)	20.29	26.41	24.65	21.56	23.17	29.46	20.59

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.32** Internal CO<sub>2</sub> (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	4.77±0.70	7.82±1.37 <sup>ab</sup>	8.23±1.78 <sup>ab</sup>	9.37±1.09 <sup>ab</sup>	9.22±1.39 <sup>b</sup>	8.72±1.51 <sup>b<sup>c</sup></sup>	9.21±1.23 <sup>ab</sup>
Fomesa	4.77±0.70	9.79±1.04 <sup>a</sup>	9.99±2.30 <sup>ab</sup>	11.84±3.26 <sup>a</sup>	10.15±1.50 <sup>b</sup>	11.21±2.12 <sup>ab</sup>	10.62±2.06 <sup>a</sup>
Citrashine	4.77±0.70	9.78±1.25 <sup>a</sup>	11.70±4.28 <sup>a</sup>	11.80±2.90 <sup>a</sup>	14.00±3.19 <sup>a</sup>	13.80±2.88 <sup>a</sup>	10.42±1.90 <sup>ab</sup>
non-coated	4.77±0.70	7.37±2.54 <sup>b</sup>	7.47±0.91 <sup>b</sup>	8.18±1.24 <sup>b</sup>	6.92±3.40 <sup>b</sup>	7.18±0.99 <sup>c</sup>	8.43±0.51 <sup>b</sup>
LSD <sub>0.05</sub>	0.94	2.22	3.71	3.13	3.61	2.85	2.08
C.V. (%)	14.67	19.03	28.44	22.65	25.83	19.42	16.06

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.32 (continued)** Internal CO<sub>2</sub> (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	9.16±0.87 <sup>b</sup>	9.65±0.68 <sup>ab</sup>	10.47±1.09 <sup>ab</sup>	10.06±1.61 <sup>b</sup>	10.82±1.30 <sup>b</sup>	12.40±1.72 <sup>a</sup>	14.78±2.59 <sup>bc</sup>
Fomesa	11.08±1.69 <sup>ab</sup>	13.58±2.37 <sup>a</sup>	12.23±4.94 <sup>a</sup>	12.02±1.62 <sup>a</sup>	15.87±6.39 <sup>a</sup>	13.54±6.02 <sup>a</sup>	18.17±5.30 <sup>ab</sup>
Citrashine	12.87±3.05 <sup>a</sup>	13.68±4.62 <sup>a</sup>	12.00±1.46 <sup>a</sup>	12.20±0.89 <sup>a</sup>	16.73±5.20 <sup>a</sup>	16.04±2.10 <sup>a</sup>	19.66±3.68 <sup>a</sup>
non-coated	8.51±1.25 <sup>b</sup>	9.27±1.65 <sup>b</sup>	7.65±1.23 <sup>b</sup>	7.10±1.02 <sup>c</sup>	7.63±4.94 <sup>c</sup>	6.50±1.93 <sup>b</sup>	10.05±1.41 <sup>c</sup>
LSD <sub>0.05</sub>	3.08	4.17	3.84	1.81	2.50	4.61	4.76
C.V. (%)	19.29	26.32	26.32	11.77	27.98	23.38	22.65

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.33** Ethanol content in juice (mg/l) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	0	2	4	6	8	10	12
Zivdar	404.08±27.07	557.49±134.36 <sup>c</sup>	847.26±29.08 <sup>b</sup>	1121.99±65.18 <sup>b</sup>	1081.89±13.04 <sup>c</sup>	1084.89±42.12 <sup>c</sup>	1432.82±536.43 <sup>b</sup>
Fomesa	404.08±27.07	1161.10±316.85 <sup>b</sup>	1066.84±36.10 <sup>b</sup>	1176.14±113.31 <sup>b</sup>	1543.11±85.23 <sup>b</sup>	1613.30±109.29 <sup>b</sup>	1782.75±218.59 <sup>b</sup>
Citrashine	404.08±27.07	1310.49±21.06 <sup>a</sup>	1606.28±144.39 <sup>a</sup>	1537.10±3.01 <sup>a</sup>	2344.25±326.87 <sup>a</sup>	2518.72±28.08 <sup>a</sup>	2651.07±182.49 <sup>a</sup>
non-coated	404.08±27.07	540.44±39.11 <sup>c</sup>	549.47±39.11 <sup>c</sup>	542.45±39.11 <sup>c</sup>	474.26±11.03 <sup>d</sup>	581.55±82.22 <sup>d</sup>	556.48±89.24 <sup>c</sup>
LSD <sub>0,05</sub>	50.95	326.56	247.27	128.43	318.30	137.24	577.67
C.V. (%)	6.70	19.44	12.91	6.23	12.43	5.03	19.11

Means followed by different superscript letters within a column are significantly different (P≤0.05)



**Table A.34** Pyruvate decarboxylase activity (units/min/mg protein) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	0.86±1.03	2.42±1.38	2.10±0.21	0.89±0.16	5.99±3.16	6.83±4.45 <sup>b</sup>	3.14±2.11 <sup>b</sup>
Fomesa	0.86±1.03	0.65±0.32	0.19±0.03	0.77±0.29	6.04±2.65	7.77±3.29 <sup>b</sup>	3.35±1.17 <sup>b</sup>
Citrashine	0.86±1.03	4.88±3.05	0.35±0.19	0.59±0.27	9.15±1.64	19.57±8.33 <sup>a</sup>	9.87±2.68 <sup>a</sup>
non-coated	0.86±1.03	0.69±0.08	1.78±1.10	0.62±0.42	4.02±3.46	5.06±0.47 <sup>b</sup>	2.18±1.77 <sup>b</sup>
LSD <sub>0.05</sub>	1.95	5.15	1.07	0.60	5.30	9.42	3.79
C.V. (%)	19.89	26.62	11.66	14.97	24.68	21.02	13.39

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.34 (continued)** Pyruvate decarboxylase activity (units/min/mg protein) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	0.42±0.34 <sup>b</sup>	1.39±0.64 <sup>b</sup>	1.12±0.73	1.06±0.16	3.20±1.29 <sup>b</sup>	0.56±0.29 <sup>b</sup>	4.11±0.20
Fomesa	4.71±1.80 <sup>a</sup>	8.90±4.91 <sup>a</sup>	1.26±0.89	0.85±0.31	5.68±2.83 <sup>a</sup>	0.43±0.13 <sup>b</sup>	0.91±0.52
Citrashine	3.29±1.08 <sup>ab</sup>	12.57±8.22 <sup>a</sup>	1.38±0.76	1.54±0.68	3.05±2.10 <sup>b</sup>	0.74±0.13 <sup>b</sup>	0.71±0.35
non-coated	0.43±0.21 <sup>b</sup>	11.93±5.39 <sup>a</sup>	0.52±0.12	1.51±0.23	6.80±1.84 <sup>a</sup>	1.44±0.29 <sup>a</sup>	0.52±0.08
LSD <sub>0.05</sub>	3.59	4.88	1.30	1.18	2.34	0.42	0.62
C.V. (%)	16.24	30.54	23.24	20.12	26.64	28.35	21.91

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.35** Alcohol dehydrogenase activity (units/min/mg protein) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	0.47±0.31	2.88±0.77	0.22±0.03	2.69±1.60	6.28±2.82 <sup>b</sup>	8.63±2.79 <sup>b</sup>	0.44±0.27 <sup>b</sup>
Fomesa	0.47±0.31	2.22±1.59	0.43±0.08	1.71±1.25	7.83±2.82 <sup>b</sup>	13.42±0.21 <sup>ab</sup>	0.55±0.27 <sup>b</sup>
Citrashine	0.47±0.31	3.81±1.36	0.48±0.19	3.00±2.29	23.0±04.54 <sup>a</sup>	21.78±13.88 <sup>a</sup>	1.09±0.38 <sup>a</sup>
non-coated	0.47±0.31	1.37±0.90	0.30±0.11	2.89±1.51	3.13±2.36 <sup>b</sup>	8.42±3.55 <sup>b</sup>	0.32±0.09 <sup>b</sup>
LSD <sub>0.05</sub>	1.95	5.15	1.07	0.60	5.30	9.42	3.79
C.V. (%)	19.89	26.62	11.66	14.97	24.68	21.02	13.39

Means followed by different superscript letters within a column are significantly different (P≤0.05).

**Table A.35 (continued)** Alcohol dehydrogenase activity (units/min/mg protein) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	1.45±1.11 <sup>c</sup>	2.00±1.04 <sup>b</sup>	1.84±0.62	3.17±1.95 <sup>b</sup>	0.92±0.33	0.46±0.18	0.44±0.23
Fomesa	0.46±0.14 <sup>c</sup>	21.62±18.56 <sup>a</sup>	1.15±0.22	2.87±1.89 <sup>b</sup>	2.66±2.03	1.73±1.32	1.29±0.68
Citrashine	8.01±4.64 <sup>a</sup>	1.67±0.75 <sup>b</sup>	1.95±0.75	10.11±5.60 <sup>a</sup>	0.33±0.03	1.26±0.57	0.74±0.15
non-coated	2.74±2.12 <sup>b</sup>	1.99±0.67 <sup>b</sup>	2.01±1.33	3.54±1.04 <sup>b</sup>	2.85±2.42	2.53±1.68	0.40±0.14
LSD <sub>0.05</sub>	3.59	4.88	1.30	1.18	2.34	0.42	0.62
C.V. (%)	16.24	30.54	23.24	20.12	26.64	28.35	21.91

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.36** Flavor score of tangerine fruit cv. ‘Sai Nam Phueng’ coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>
Fomesa	4.00±0.00	4.00±0.00	4.00±0.00	3.67±0.52	3.67±0.52	3.33±0.52 <sup>b</sup>	3.25±0.46 <sup>b</sup>
Citrashine	4.00±0.00	4.00±0.00	4.00±0.00	3.67±0.52	3.33±1.03	3.00±0.89 <sup>b</sup>	3.00±0.46 <sup>b</sup>
non-coated	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>
LSD <sub>0.05</sub>	-	-	-	0.44	0.78	0.62	0.34
C.V. (%)	-	-	-	9.52	16.33	14.41	8.73

Means followed by different superscript letters within a column are significantly different ( $P \leq 0.05$ )

Evaluation of flavor by tasting, using a scale of 1 to 4 where 4 = excellent, 3 = slightly off-flavor, 2 = moderately off-flavor and 1 = extremely off-flavor. Fruit taste was rated “unacceptable” when the taste score was below three.

**Table A.36 (continued)** Flavor score of tangerine fruit cv. ‘Sai Nam Phueng’ coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.67±0.52 <sup>a</sup>	3.25±0.46 <sup>b</sup>	3.00±0.00 <sup>b</sup>	3.00±0.00 <sup>b</sup>
Fomesa	3.00±0.00 <sup>b</sup>	3.00±0.94 <sup>b</sup>	3.00±0.94 <sup>b</sup>	2.67±0.52 <sup>b</sup>	2.50±0.54 <sup>c</sup>	2.33±0.52 <sup>c</sup>	2.00±0.00 <sup>c</sup>
Citrashine	2.33±0.52 <sup>b</sup>	2.50±0.53 <sup>b</sup>	2.40±0.52 <sup>c</sup>	2.00±0.00 <sup>c</sup>	1.25±0.46 <sup>d</sup>	1.33±0.52 <sup>d</sup>	1.25±0.46 <sup>d</sup>
non-coated	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.67±0.52 <sup>a</sup>	3.75±0.46 <sup>a</sup>
LSD <sub>0.05</sub>	0.31	0.61	0.49	0.44	0.43	0.54	0.34
C.V. (%)	7.75	17.71	16.04	9.60	15.37	17.31	13.09

Means followed by different superscript letters within a column are significantly different ( $P \leq 0.05$ )

Evaluation of flavor by tasting, using a scale of 1 to 4 where 4 = excellent, 3 = slightly off-flavor, 2 = moderately off-flavor and 1 = extremely off-flavor. Fruit taste was rated “unacceptable” when the taste score was below three.

**Table A.37** Visual appearance score of tangerine fruit cv. ‘Sai Nam Phueng’ coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	5.00±0.00	5.00±0.00	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.75±0.46 <sup>a</sup>
Fomesa	5.00±0.00	5.00±0.00	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.75±0.46 <sup>a</sup>
Citrashine	5.00±0.00	5.00±0.00	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.75±0.46 <sup>a</sup>
non-coated	5.00±0.00	5.00±0.00	5.00±0.00	5.00±0.00	4.33±0.52 <sup>b</sup>	4.33±0.52 <sup>b</sup>	2.75±0.46 <sup>b</sup>
LSD <sub>0.05</sub>	-	-	-	-	0.31	0.31	0.47
C.V. (%)	-	-	-	-	5.34	5.34	10.89

Means followed by different superscript letters within a column are significantly different (P≤0.05)

Evaluation of visual appearance (wilting and shriveling), using a scale of 1 to 5 where 5 = excellent, 4 = good, 3 = fair, 2 = poor and 1 = unusable. Fruit appearance was rated “unacceptable” when the score was below three.

**Table A.37 (continued)** Visual appearance score of tangerine fruit cv. ‘Sai Nam Phueng’ coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	4.67±0.52 <sup>a</sup>	4.25±0.46 <sup>a</sup>	4.00±0.94 <sup>a</sup>	3.67±0.52 <sup>a</sup>	3.25±0.46 <sup>a</sup>	3.00±0.00 <sup>a</sup>	2.75±0.89 <sup>a</sup>
Fomesa	4.33±0.52 <sup>a</sup>	4.00±0.76 <sup>a</sup>	3.60±0.84 <sup>a</sup>	3.67±0.52 <sup>a</sup>	3.00±0.00 <sup>a</sup>	3.00±0.00 <sup>a</sup>	2.50±0.53 <sup>a</sup>
Citrashine	4.67±0.52 <sup>a</sup>	4.50±0.53 <sup>a</sup>	4.20±0.79 <sup>a</sup>	3.67±0.52 <sup>a</sup>	3.25±0.46 <sup>a</sup>	3.33±0.52 <sup>a</sup>	3.00±1.07 <sup>a</sup>
non-coated	3.00±0.89 <sup>b</sup>	2.75±0.46 <sup>b</sup>	2.80±0.42 <sup>b</sup>	2.67±0.52 <sup>b</sup>	2.00±0.76 <sup>b</sup>	1.67±0.52 <sup>b</sup>	1.50±0.53 <sup>b</sup>
LSD <sub>0.05</sub>	0.76	0.58	0.70	0.62	0.52	0.44	0.81
C.V. (%)	15.18	32.14	21.52	15.11	17.39	13.28	32.43

Means followed by different superscript letters within a column are significantly different (P≤0.05)

Evaluation of visual appearance (wilting and shriveling), using a scale of 1 to 5 where 5 = excellent, 4 = good, 3 = fair, 2 = poor and 1 = unusable. Fruit appearance was rated “unacceptable” when the score was below three.

**Table A.38** L\* of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature ( $24\pm 3^\circ\text{C}$ ) and  $59\pm 6\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	66.09 $\pm$ 3.18	66.32 $\pm$ 2.25	65.91 $\pm$ 3.13	65.43 $\pm$ 3.11	64.88 $\pm$ 3.15	64.82 $\pm$ 3.20	64.87 $\pm$ 3.14
Fomesa	65.15 $\pm$ 3.81	66.13 $\pm$ 3.69	64.90 $\pm$ 3.66	64.51 $\pm$ 3.75	64.39 $\pm$ 6.52	64.04 $\pm$ 3.42	63.73 $\pm$ 3.99
Citrashine non-coated	65.75 $\pm$ 1.83	65.66 $\pm$ 1.66	65.54 $\pm$ 1.69	65.04 $\pm$ 2.28	65.10 $\pm$ 1.89	64.99 $\pm$ 1.88	64.19 $\pm$ 2.59
	66.21 $\pm$ 2.62	66.24 $\pm$ 2.37	66.09 $\pm$ 2.05	65.72 $\pm$ 1.99	65.03 $\pm$ 1.95	64.33 $\pm$ 3.14	65.18 $\pm$ 1.94
LSD <sub>0.05</sub>	1.94	1.70	1.81	1.88	1.79	1.95	1.97
C.V. (%)	4.54	3.99	4.26	4.46	4.26	4.67	4.71

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.38 (continued)** L\* of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature ( $24\pm 3^\circ\text{C}$ ) and  $59\pm 6\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	65.30 $\pm$ 2.85	64.75 $\pm$ 3.44	64.84 $\pm$ 3.11	64.95 $\pm$ 2.76	64.95 $\pm$ 2.98	64.67 $\pm$ 2.87	64.39 $\pm$ 2.75
Fomesa	64.88 $\pm$ 3.35	64.14 $\pm$ 3.58	64.07 $\pm$ 3.45	63.88 $\pm$ 3.18	64.22 $\pm$ 3.27	63.74 $\pm$ 2.89	63.16 $\pm$ 3.12
Citrashine non-coated	65.03 $\pm$ 1.61	64.61 $\pm$ 2.10	64.78 $\pm$ 1.86	64.67 $\pm$ 2.11	64.29 $\pm$ 1.91	64.17 $\pm$ 1.85	64.10 $\pm$ 2.17
	64.95 $\pm$ 2.28	65.11 $\pm$ 1.96	65.08 $\pm$ 2.00	64.79 $\pm$ 2.24	64.78 $\pm$ 1.69	64.37 $\pm$ 1.90	64.25 $\pm$ 2.36
LSD <sub>0.05</sub>	1.71	1.88	1.77	1.70	1.68	1.59	1.71
C.V. (%)	4.07	4.50	4.23	4.07	4.01	3.83	4.13

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.39** Chroma of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature ( $24\pm 3^{\circ}\text{C}$ ) and  $59\pm 6\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	59.87±7.13	58.71±6.99	59.90±7.48	58.89±6.89	59.17±6.47	58.73±7.47	59.54±7.80
Fomesa	57.66±7.98	57.83±7.93	57.25±7.62	57.57±7.75	57.98±7.20	57.39±7.59	57.02±8.65
Citrashine	59.65±3.71	60.09±3.62	60.23±4.01	60.01±4.02	60.52±4.44	60.14±3.34	60.22±4.21
non-coated	60.74±6.2	61.42±5.59	61.82±5.03	61.49±5.42	61.15±5.49	62.20±6.63	61.28±5.23
LSD <sub>0.05</sub>	4.20	4.10	4.09	4.05	3.91	4.25	4.41
C.V. (%)	10.91	10.63	10.57	10.53	10.13	11.01	11.46

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ ).

**Table A.39 (continued)** Chroma of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature ( $24\pm 3^{\circ}\text{C}$ ) and  $59\pm 6\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	60.28±5.78	58.86±7.72	58.91±7.31	58.85±7.41	57.90±7.27	58.54±6.73	58.01±6.95
Fomesa	56.39±7.83	57.63±7.68	57.07±7.82	56.97±7.09	56.37±7.22	56.12±7.09	55.75±7.33
Citrashine	60.12±3.56	60.51±4.32	59.84±3.50	59.84±3.89	59.56±5.01	58.49±3.83	59.43±4.56
non-coated	59.82±6.12	60.19±5.03	60.23±5.37	59.95±4.91	59.78±5.05	59.24±4.85	59.50±5.25
LSD <sub>0.05</sub>	3.93	4.18	4.09	3.94	4.08	3.79	4.01
C.V. (%)	10.26	10.90	10.72	10.34	10.72	10.08	10.66

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ ).

**Table A.40** Hue angle of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature ( $24\pm 3^{\circ}\text{C}$ ) and  $59\pm 6\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	75.04±6.37	76.03±7.10	76.56±8.01	74.36±6.37	74.90±7.27	74.52±6.73	73.67±7.21
Fomesa	76.64±6.98	75.24±6.08	75.14±6.52	74.17±6.44	74.55±6.18	73.61±6.03	74.30±6.98
Citrasine	74.63±4.35	74.12±4.43	73.59±5.21	73.66±4.90	73.01±6.47	72.75±4.30	73.23±5.18
non-coated	74.64±5.09	75.07±5.95	74.89±5.63	74.02±5.69	74.73±5.71	73.10±5.72	73.30±5.37
LSD <sub>0.05</sub>	3.79	3.89	4.20	3.83	4.18	3.76	4.08
C.V. (%)	7.76	7.99	8.64	7.97	8.68	7.89	8.56

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.40 (continued)** Hue angle of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature ( $24\pm 3^{\circ}\text{C}$ ) and  $59\pm 6\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	73.46±6.09	73.83±7.04	73.84±6.57	73.39±6.61	73.96±6.35	71.38±6.88	71.93±6.77
Fomesa	73.87±6.32	73.24±6.13	73.52±6.54	73.24±6.31	73.50±6.25	71.62±5.67	72.74±6.10
Citrasine	73.02±4.64	73.12±4.06	73.12±4.83	72.84±4.97	73.19±5.70	71.67±5.25	71.37±5.11
non-coated	73.18±5.96	73.03±5.60	73.12±6.10	73.05±4.98	72.81±5.67	71.40±5.65	71.64±5.40
LSD <sub>0.05</sub>	3.77	3.80	3.94	3.76	3.90	3.83	3.83
C.V. (%)	7.92	8.01	8.28	7.94	8.20	8.27	8.22

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.41** Total soluble solids (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	12.40±0.61	12.37±0.35	12.40±0.87	13.13±0.81	11.23±1.04	13.40±0.66	12.07±0.78
Fomesa	12.40±0.61	11.70±1.00	11.90±0.40	11.27±1.38	12.53±0.49	12.60±0.66	13.00±0.62
Citrashine	12.40±0.61	12.87±0.55	11.90±0.26	12.47±0.65	11.77±1.18	12.13±0.12	12.57±0.59
non-coated	12.40±0.61	13.30±0.95	12.70±0.44	11.77±0.86	12.17±0.99	11.63±0.68	11.67±0.32
LSD <sub>0.05</sub>	1.14	1.44	1.02	1.82	1.81	1.09	1.13
C.V. (%)	4.91	6.09	4.44	7.94	8.07	4.55	4.7

Means followed by different superscript letters within a column are significantly different ( $P \leq 0.05$ )

**Table A.41 (continued)** Total soluble solids (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	13.03±0.15 <sup>a</sup>	12.97±0.81	12.97±0.12	12.53±1.12	12.40±0.69	13.10±0.44	13.43±0.91 <sup>a</sup>
Fomesa	12.10±0.30 <sup>a</sup>	12.33±0.75	12.30±0.40	13.00±0.60	12.50±0.76	12.17±0.51	12.43±0.55 <sup>ab</sup>
Citrashine	11.90±0.87 <sup>ab</sup>	12.03±0.40	12.60±0.53	12.83±0.76	12.10±0.76	12.43±0.29	11.90±0.26 <sup>b</sup>
non-coated	11.57±0.68 <sup>b</sup>	11.87±0.21	11.93±0.57	12.43±0.93	11.70±0.52	12.03±0.84	13.20±0.20 <sup>a</sup>
LSD <sub>0.05</sub>	1.09	1.12	0.83	1.64	1.29	1.05	1.05
C.V. (%)	4.66	4.85	3.54	6.88	5.65	4.48	4.36

Means followed by different superscript letters within a column are significantly different ( $P \leq 0.05$ )



**Table A.42** Titratable acidity (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	0.72±0.04	0.75±0.07	0.70±0.11	0.77±0.09	0.63±0.09	0.69±0.05	0.66±0.06
Fomesa	0.72±0.04	0.81±0.07	0.70±0.03	0.71±0.08	0.68±0.12	0.72±0.04	0.65±0.09
Citrashine	0.72±0.04	0.66±0.13	0.71±0.03	0.68±0.08	0.61±0.07	0.66±0.02	0.73±0.08
non-coated	0.72±0.04	0.86±0.03	0.79±0.02	0.74±0.08	0.73±0.04	0.64±0.09	0.60±0.03
LSD <sub>0.05</sub>	0.07	0.16	0.11	0.16	0.16	0.11	0.13
C.V. (%)	5.01	10.70	8.18	11.61	12.82	8.49	10.15

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.42 (continued)** Titratable acidity (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature (24±3°C) and 59±6% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	0.74±0.04	0.73±0.11	0.71±0.05	0.66±0.06	0.64±0.00	0.72±0.05 <sup>ab</sup>	0.69±0.03
Fomesa	0.68±0.13	0.65±0.08	0.61±0.04	0.69±0.10	0.68±0.01	0.61±0.03 <sup>c</sup>	0.63±0.06
Citrashine	0.70±0.04	0.61±0.04	0.63±0.03	0.62±0.06	0.61±0.05	0.70±0.01 <sup>b</sup>	0.62±0.04
non-coated	0.65±0.10	0.72±0.05	0.68±0.09	0.62±0.09	0.64±0.08	0.78±0.05 <sup>a</sup>	0.65±0.06
LSD <sub>0.05</sub>	0.16	0.14	0.11	0.15	0.09	0.07	0.09
C.V. (%)	12.52	11.25	8.73	12.39	7.15	5.53	22.88

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.43** TSS/TA ratio of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature ( $24\pm 3^\circ\text{C}$ ) and  $59\pm 6\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	17.28 $\pm$ 1.18	16.67 $\pm$ 1.93	18.02 $\pm$ 3.25	17.21 $\pm$ 3.25	18.02 $\pm$ 2.39	19.50 $\pm$ 2.08	18.31 $\pm$ 2.22
Fomesa	17.28 $\pm$ 1.18	14.45 $\pm$ 1.42	17.12 $\pm$ 0.51	15.27 $\pm$ 0.41	18.80 $\pm$ 2.39	17.60 $\pm$ 1.79	20.09 $\pm$ 2.40
Citrashine	17.28 $\pm$ 1.18	19.92 $\pm$ 3.93	16.79 $\pm$ 0.43	18.73 $\pm$ 2.31	19.29 $\pm$ 1.21	18.45 $\pm$ 0.52	17.45 $\pm$ 2.65
non-coated	17.28 $\pm$ 1.18	15.39 $\pm$ 0.60	16.10 $\pm$ 0.16	15.91 $\pm$ 0.73	16.76 $\pm$ 1.69	20.05 $\pm$ 3.12	19.39 $\pm$ 0.44
LSD <sub>0.05</sub>	2.23	4.37	3.12	3.84	3.73	3.94	3.98
C.V. (%)	6.85	13.98	9.76	12.07	10.89	11.07	11.24

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ ).

**Table A.43 (continued)** TSS/TA ratio of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature ( $24\pm 3^\circ\text{C}$ ) and  $59\pm 6\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	17.59 $\pm$ 0.92	17.99 $\pm$ 1.70	18.21 $\pm$ 1.11	19.12 $\pm$ 1.83	19.25 $\pm$ 1.08	18.14 $\pm$ 0.68 <sup>b</sup>	19.57 $\pm$ 0.53
Fomesa	18.36 $\pm$ 3.89	19.21 $\pm$ 2.70	19.99 $\pm$ 0.65	19.04 $\pm$ 2.23	18.48 $\pm$ 1.30	20.06 $\pm$ 0.48 <sup>a</sup>	19.81 $\pm$ 1.26
Citrashine	18.43 $\pm$ 0.49	19.73 $\pm$ 0.96	20.00 $\pm$ 0.59	20.90 $\pm$ 0.97	19.84 $\pm$ 1.22	17.89 $\pm$ 0.55 <sup>b</sup>	19.20 $\pm$ 0.68
non-coated	18.20 $\pm$ 2.60	16.56 $\pm$ 0.98	17.79 $\pm$ 1.76	20.32 $\pm$ 1.62	18.42 $\pm$ 1.52	15.58 $\pm$ 1.58 <sup>c</sup>	20.32 $\pm$ 1.97
LSD <sub>0.05</sub>	4.51	3.27	2.13	3.25	2.42	1.76	2.34
C.V. (%)	13.19	9.45	5.95	8.69	6.78	5.22	6.32

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.44** pH of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature ( $24\pm 3^{\circ}\text{C}$ ) and  $59\pm 6\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	2.79 $\pm$ 0.03	2.82 $\pm$ 0.11	3.01 $\pm$ 0.13	3.02 $\pm$ 0.13	2.94 $\pm$ 0.08	2.99 $\pm$ 0.18	3.03 $\pm$ 0.16
Fomesa	2.79 $\pm$ 0.03	2.71 $\pm$ 0.04	3.08 $\pm$ 0.54	2.96 $\pm$ 0.04	2.88 $\pm$ 0.05	2.92 $\pm$ 0.04	2.99 $\pm$ 0.08
Citrashine	2.79 $\pm$ 0.03	2.86 $\pm$ 0.17	2.87 $\pm$ 0.05	2.95 $\pm$ 0.12	2.90 $\pm$ 0.08	2.90 $\pm$ 0.05	2.92 $\pm$ 0.10
non-coated	2.79 $\pm$ 0.03	2.63 $\pm$ 0.02	2.82 $\pm$ 0.02	2.87 $\pm$ 0.07	2.84 $\pm$ 0.08	2.83 $\pm$ 0.15	3.03 $\pm$ 0.06
LSD <sub>0.05</sub>	0.06	0.20	0.53	0.19	0.14	0.23	0.20
C.V. (%)	1.13	3.86	9.25	3.35	2.50	4.12	3.55

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.44 (continued)** pH of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature ( $24\pm 3^{\circ}\text{C}$ ) and  $59\pm 6\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	2.95 $\pm$ 0.09	2.95 $\pm$ 0.17	2.72 $\pm$ 0.04 <sup>b</sup>	3.22 $\pm$ 0.02	3.04 $\pm$ 0.02	3.07 $\pm$ 0.04 <sup>a</sup>	2.82 $\pm$ 0.09
Fomesa	2.91 $\pm$ 0.09	3.03 $\pm$ 0.11	2.89 $\pm$ 0.03 <sup>a</sup>	3.16 $\pm$ 0.03	3.15 $\pm$ 0.03	3.04 $\pm$ 0.09 <sup>a</sup>	2.92 $\pm$ 0.12
Citrashine	2.92 $\pm$ 0.10	2.90 $\pm$ 0.06	2.88 $\pm$ 0.04 <sup>a</sup>	3.20 $\pm$ 0.09	3.22 $\pm$ 0.05	3.05 $\pm$ 0.03 <sup>a</sup>	2.98 $\pm$ 0.09
non-coated	2.93 $\pm$ 0.24	2.84 $\pm$ 0.08	2.85 $\pm$ 0.10 <sup>a</sup>	3.17 $\pm$ 0.11	3.14 $\pm$ 0.14	2.88 $\pm$ 0.03 <sup>b</sup>	2.85 $\pm$ 0.06
LSD <sub>0.05</sub>	0.27	0.21	0.11	0.17	0.14	0.10	0.17
C.V. (%)	4.88	3.79	2.06	2.79	2.45	1.73	3.13

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.45** Vitamin C content (mg/100 ml juice) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature ( $24\pm 3^{\circ}\text{C}$ ) and  $59\pm 6\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Zivdar	21.29 $\pm$ 1.94	20.00 $\pm$ 2.23	20.26 $\pm$ 1.13	20.26 $\pm$ 1.10	21.43 $\pm$ 0.00	20.64 $\pm$ 1.12	21.15 $\pm$ 1.93
Fomesa	21.29 $\pm$ 1.94	21.94 $\pm$ 1.21	20.92 $\pm$ 2.99	22.15 $\pm$ 2.9	20.78 $\pm$ 2.25	18.61 $\pm$ 1.11	18.59 $\pm$ 1.11
Citrashine	21.29 $\pm$ 1.94	23.23 $\pm$ 1.94	22.88 $\pm$ 1.13	18.99 $\pm$ 0.00	24.03 $\pm$ 1.12	20.00 $\pm$ 1.12	22.44 $\pm$ 1.11
non-coated	21.29 $\pm$ 1.94	23.87 $\pm$ 1.11	21.57 $\pm$ 0.00	20.88 $\pm$ 3.29	20.13 $\pm$ 2.98	20.00 $\pm$ 2.96	18.97 $\pm$ 2.22
LSD <sub>0.05</sub>	3.65	3.15	3.20	4.25	3.67	3.33	3.13
C.V. (%)	9.11	7.53	7.93	10.98	9.03	8.99	8.12

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.45 (continued)** Vitamin C content (mg/100 ml juice) of tangerine fruit cv. 'Sai Nam Phueng' coated with 3 commercial coatings by commercial method during storage at room temperature ( $24\pm 3^{\circ}\text{C}$ ) and  $59\pm 6\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Zivdar	20.51 $\pm$ 1.11	22.58 $\pm$ 1.12	18.59 $\pm$ 2.22	20.38 $\pm$ 2.21	22.22 $\pm$ 1.10	18.52 $\pm$ 1.85	18.99 $\pm$ 1.90
Fomesa	22.43 $\pm$ 2.22	20.00 $\pm$ 1.12	17.95 $\pm$ 1.11	21.66 $\pm$ 4.41	19.68 $\pm$ 2.91	19.75 $\pm$ 2.14	22.78 $\pm$ 3.29
Citrashine	20.51 $\pm$ 1.11	22.58 $\pm$ 1.12	20.51 $\pm$ 1.11	21.02 $\pm$ 1.91	20.32 $\pm$ 1.10	21.60 $\pm$ 1.07	22.78 $\pm$ 1.90
non-coated	20.51 $\pm$ 2.94	19.35 $\pm$ 1.30	21.15 $\pm$ 1.93	22.93 $\pm$ 1.91	19.51 $\pm$ 1.91	20.37 $\pm$ 1.85	20.26 $\pm$ 1.10
LSD <sub>0.05</sub>	3.77	2.58	3.13	5.29	3.59	3.33	4.12
C.V. (%)	9.54	6.48	8.51	13.80	9.38	8.83	10.33

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.46** Weight loss (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with commercial coatings by commercial method during storage at 5±2°C and 85±3% relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	0.00±0.00	0.36±0.07 <sup>ab</sup>	1.15±0.17 <sup>b</sup>	1.93±0.30 <sup>b</sup>	2.68±0.42 <sup>b</sup>	3.23±0.52 <sup>b</sup>	4.13±0.69 <sup>b</sup>	4.82±0.82 <sup>b</sup>	5.56±0.96 <sup>b</sup>	6.31±1.11 <sup>b</sup>	7.07±1.26 <sup>b</sup>
Fomesa	0.00±0.00	0.24±0.04 <sup>c</sup>	0.89±0.13 <sup>c</sup>	1.56±0.22 <sup>c</sup>	2.17±0.30 <sup>c</sup>	2.62±0.41 <sup>c</sup>	3.53±0.47 <sup>c</sup>	4.24±0.56 <sup>bc</sup>	4.94±0.64 <sup>bc</sup>	5.66±0.73 <sup>bc</sup>	6.87±2.29 <sup>b</sup>
Citrahine	0.00±0.00	0.35±0.13 <sup>b</sup>	0.98±0.17 <sup>c</sup>	1.62±0.26 <sup>c</sup>	2.20±0.36 <sup>c</sup>	2.72±0.44 <sup>c</sup>	3.49±0.57 <sup>c</sup>	4.05±0.67 <sup>c</sup>	4.73±0.78 <sup>c</sup>	5.39±0.89 <sup>c</sup>	6.06±1.01 <sup>b</sup>
non-coated	0.00±0.00	0.41±0.12 <sup>a</sup>	1.32±0.34 <sup>a</sup>	2.19±0.58 <sup>a</sup>	3.01±0.80 <sup>a</sup>	3.71±0.96 <sup>a</sup>	4.83±1.20 <sup>a</sup>	5.69±1.42 <sup>a</sup>	6.54±1.63 <sup>a</sup>	7.47±1.85 <sup>a</sup>	8.40±2.06 <sup>a</sup>
LSD <sub>0.05</sub>	-	0.06	0.14	0.23	0.32	0.39	0.49	0.59	0.68	0.77	1.10
C.V. (%)	-	27.75	20.21	20.02	20.18	20.25	19.63	19.82	19.74	19.72	20.52

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.47** Internal O<sub>2</sub> (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with commercial coatings by commercial method during storage at 5±2°C and 85±3% relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	16.34±0.73	13.58±1.03 <sup>a</sup>	14.77±3.30 <sup>ab</sup>	12.79±2.79 <sup>ab</sup>	9.62±4.35 <sup>ab</sup>	9.80±1.64 <sup>b</sup>	10.77±2.41 <sup>ab</sup>	10.86±2.84 <sup>b</sup>	11.27±4.56 <sup>a</sup>	9.36±4.76 <sup>b</sup>	9.62±2.68 <sup>b</sup>
Fomesa	16.34±0.73	10.06±1.14 <sup>b</sup>	9.31±0.95 <sup>c</sup>	11.71±4.20 <sup>bc</sup>	7.00±1.90 <sup>bc</sup>	7.86±1.88 <sup>b</sup>	9.50±4.29 <sup>b</sup>	7.39±2.81 <sup>c</sup>	6.66±1.59 <sup>b</sup>	4.11±1.39 <sup>c</sup>	3.21±1.15 <sup>c</sup>
Citrahine	16.34±0.73	10.54±1.78 <sup>b</sup>	11.25±4.46 <sup>bc</sup>	10.22±5.61 <sup>c</sup>	4.86±2.49 <sup>c</sup>	4.26±2.82 <sup>c</sup>	3.26±1.34 <sup>c</sup>	5.45±2.91 <sup>c</sup>	3.82±1.10 <sup>b</sup>	4.22±2.02 <sup>c</sup>	4.02±2.16 <sup>c</sup>
non-coated	16.34±0.73	14.72±0.99 <sup>a</sup>	16.43±3.57 <sup>a</sup>	13.62±5.51 <sup>a</sup>	13.83±4.02 <sup>a</sup>	13.58±3.68 <sup>a</sup>	13.46±2.47 <sup>a</sup>	14.66±1.33 <sup>a</sup>	14.73±1.56 <sup>a</sup>	14.67±2.05 <sup>a</sup>	13.46±2.18 <sup>a</sup>
LSD <sub>0.05</sub>	0.98	1.71	4.47	2.42	4.49	3.53	4.21	4.71	4.34	6.36	4.55
C.V. (%)	4.47	10.43	25.75	38.85	37.94	29.62	35.84	32.00	35.51	52.20	42.46

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.48** Internal CO<sub>2</sub> (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with commercial coatings by commercial method during storage at 5±2°C and 85±3% relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	4.71±0.69	5.06±1.78 <sup>b</sup>	6.36±2.08 <sup>b</sup>	6.01±1.63 <sup>b</sup>	5.83±0.45 <sup>b</sup>	4.68±1.60 <sup>b</sup>	6.14±2.12 <sup>bc</sup>	5.83±0.45 <sup>b</sup>	8.53±1.58 <sup>bc</sup>	10.16±2.32 <sup>bc</sup>	13.07±1.73 <sup>bc</sup>
Fomesa	4.71±0.69	7.67±1.23 <sup>ab</sup>	9.00±0.92 <sup>a</sup>	10.94±2.07 <sup>a</sup>	8.53±1.98 <sup>a</sup>	10.97±3.81 <sup>a</sup>	11.05±2.02 <sup>a</sup>	8.53±1.97 <sup>a</sup>	12.79±3.76 <sup>a</sup>	14.13±2.88 <sup>a</sup>	18.33±3.56 <sup>a</sup>
Citrashine	4.71±0.69	9.73±1.82 <sup>a</sup>	7.05±1.71 <sup>ab</sup>	11.67±2.44 <sup>a</sup>	8.33±0.97 <sup>a</sup>	12.40±2.82 <sup>a</sup>	11.04±3.93 <sup>a</sup>	8.33±0.97 <sup>a</sup>	10.87±1.70 <sup>ab</sup>	13.12±2.90 <sup>ab</sup>	15.54±3.86 <sup>ab</sup>
non-coated	4.71±0.69	4.20±1.82 <sup>b</sup>	4.60±2.21 <sup>c</sup>	4.54±1.08 <sup>b</sup>	4.95±1.25 <sup>b</sup>	3.68±0.68 <sup>b</sup>	4.30±1.76 <sup>c</sup>	4.95±1.25 <sup>b</sup>	5.67±2.13 <sup>c</sup>	6.75±1.67 <sup>c</sup>	9.83±1.45 <sup>c</sup>
LSD <sub>0.05</sub>	0.93	3.42	2.42	2.90	2.54	5.16	4.22	2.54	3.91	4.38	4.10
C.V. (%)	14.68	27.00	21.22	26.08	24.90	48.45	28.92	24.90	27.47	25.38	19.85

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.49** Ethanol content in juice (mg/L) of tangerine fruit cv. 'Sai Nam Phueng' coated with commercial coatings by commercial method during storage at 5±2°C and 85±3% relative humidity for 41 days

Treatments	Storage time (days)			
	0	11	21	31
Zivdar	404.08±27.07	437.17±86.23 <sup>ab</sup>	429.14±82.22 <sup>bc</sup>	478.28±67.18 <sup>b</sup>
Fomesa	404.08±27.07	376.00±67.18 <sup>b</sup>	602.61±69.19 <sup>a</sup>	649.73±60.16 <sup>b</sup>
Citrashine	404.08±27.07	530.41±43.12 <sup>a</sup>	539.44±18.05 <sup>ab</sup>	1075.87±171.46 <sup>a</sup>
non-coated	404.08±27.07	352.94±84.23 <sup>b</sup>	345.92±97.26 <sup>c</sup>	449.20±142.38 <sup>b</sup>
LSD <sub>0.05</sub>	50.95	136.06	137.45	226.26
C.V. (%)	6.70	17.04	15.24	18.12

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.50** Pyruvate decarboxylase activity (units/min/mg protein) of tangerine fruit cv. 'Sai Nam Phueng' coated with commercial coatings by commercial method during storage at  $5\pm 2^\circ\text{C}$  and  $85\pm 3\%$  relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	0.86±0.60	0.44±0.09	0.98±0.40	0.34±0.13	1.77±0.93	0.32±0.20	0.28±0.11 <sup>ab</sup>	0.30±0.16	0.22±0.12 <sup>c</sup>	0.42±0.13 <sup>b</sup>	0.54±0.29
Fomesa	0.86±0.60	0.65±0.35	1.46±0.82	0.43±0.12	0.59±0.39	0.58±0.27	0.40±0.18 <sup>ab</sup>	0.46±0.17	0.34±0.12 <sup>bc</sup>	1.02±0.82 <sup>a</sup>	0.28±0.12
Citrahine	0.86±0.60	0.82±0.13	0.26±0.04	0.63±0.24	0.42±0.16	0.39±0.17	0.51±0.08 <sup>a</sup>	0.24±0.25	0.45±0.16 <sup>ab</sup>	0.65±0.27 <sup>b</sup>	0.29±0.14
non-coated	0.86±0.60	0.61±0.38	1.13±0.74	1.09±0.67	0.62±0.14	0.42±0.16	0.18±0.06 <sup>b</sup>	0.27±0.14	0.64±0.07 <sup>a</sup>	0.48±0.14 <sup>b</sup>	0.54±0.22
LSD <sub>0.05</sub>	1.95	0.50	1.49	0.69	1.58	0.45	0.22	0.35	0.23	0.83	0.65
C.V. (%)	19.89	22.62	22.52	29.22	28.83	25.95	14.98	28.04	29.57	28.99	23.52

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.51** Alcohol dehydrogenase activity (units/min/mg protein) of tangerine fruit cv. 'Sai Nam Phueng' coated with commercial coatings by commercial method during storage at  $5\pm 2^\circ\text{C}$  and  $85\pm 3\%$  relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	0.47±0.31	0.55±0.06	0.96±0.37	0.41±0.24	1.01±0.47	0.32±0.12	0.44±0.23	0.46±0.27	0.21±0.09	0.60±0.43	0.59±0.13
Fomesa	0.47±0.31	0.91±0.39	0.52±0.22	0.54±0.15	0.32±0.09	0.39±0.10	0.36±0.18	0.96±0.51	0.18±0.02	0.38±0.21	0.28±0.02
Citrahine	0.47±0.31	0.99±0.45	0.60±0.31	0.75±0.05	0.51±0.06	0.32±0.04	0.62±0.36	0.22±0.03	0.16±0.00	0.53±0.27	0.54±0.18
non-coated	0.47±0.31	0.91±0.25	0.52±0.02	0.92±0.34	0.69±0.25	0.53±0.09	0.32±0.10	0.18±0.07	0.14±0.02	0.40±0.19	0.32±0.14
LSD <sub>0.05</sub>	0.58	1.05	0.50	0.61	0.87	0.29	0.45	0.88	0.09	0.66	0.35
C.V. (%)	25.93	26.29	25.13	19.41	32.87	19.00	24.70	32.28	28.37	33.42	22.56

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.52** Flavor score of tangerine fruit cv. ‘Sai Nam Phueng’ coated with commercial coatings by commercial method during storage at 5±2°C and 85±3% relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.40±0.52 <sup>b</sup>	3.25±0.46 <sup>b</sup>
Fomesa	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.40±0.52 <sup>b</sup>	3.20±0.79 <sup>b</sup>	2.67±0.52 <sup>b</sup>	2.20±0.79 <sup>c</sup>	2.50±0.53 <sup>c</sup>
Citrahine	4.00±0.00	4.00±0.00	4.00±0.00	3.75±0.46	3.40±0.52 <sup>b</sup>	3.40±0.52 <sup>b</sup>	3.40±0.52 <sup>b</sup>	2.80±0.42 <sup>b</sup>	2.67±0.52 <sup>b</sup>	2.20±0.42 <sup>c</sup>	2.00±0.76 <sup>c</sup>
non-coated	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>
LSD <sub>0.05</sub>	-	-	-	0.24	0.23	0.23	0.33	0.41	0.44	0.47	0.53
C.V. (%)	-	-	-	5.88	6.71	6.71	9.87	12.78	10.95	17.51	17.62

Means followed by different superscript letters within a column are significantly different (P≤0.05)

Evaluation of flavor by tasting, using a scale of 1 to 4 where 4 = excellent, 3 = slightly off-flavor, 2 = moderately off-flavor and 1 = extremely off-flavor. Fruit taste was rated “unacceptable” when the taste score was below three.

**Table A.53** Visual appearance score of tangerine fruit cv. ‘Sai Nam Phueng’ coated with commercial coatings by commercial method during storage at 5±2°C and 85±3% relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.20±0.42 <sup>b</sup>	4.00±0.00 <sup>b</sup>	4.00±0.00 <sup>ab</sup>	3.00±0.67 <sup>b</sup>	3.25±0.89 <sup>a</sup>
Fomesa	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.40±0.52 <sup>b</sup>	3.60±0.52 <sup>b</sup>	3.67±0.52 <sup>b</sup>	3.60±0.52 <sup>a</sup>	3.75±0.46 <sup>a</sup>
Citrahine	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.33±0.52 <sup>a</sup>	4.00±0.67 <sup>a</sup>	3.75±0.46 <sup>a</sup>
non-coated	5.00±0.00	5.00±0.00	4.50±0.53 <sup>b</sup>	4.25±0.00 <sup>b</sup>	4.00±0.67 <sup>b</sup>	4.00±0.00 <sup>b</sup>	3.20±0.79 <sup>c</sup>	2.40±0.52 <sup>d</sup>	2.33±0.52 <sup>c</sup>	2.20±0.42 <sup>c</sup>	2.00±0.00 <sup>b</sup>
LSD <sub>0.05</sub>	-	-	0.27	0.24	0.31	0.03	0.47	0.33	0.54	0.52	0.56
C.V. (%)	-	-	5.48	4.81	7.56	0.00	3.89	9.74	12.48	18.04	17.29

Means followed by different superscript letters within a column are significantly different (P≤0.05)

Evaluation of visual appearance (wilting and shriveling), using a scale of 1 to 5 where 5 = excellent, 4 = good, 3 = fair, 2 = poor and 1 = unusable. Fruit appearance was rated “unacceptable” when the score was below three.



**Table A.54** L\* of tangerine fruit cv. 'Sai Nam Phueng' coated with commercial coatings by commercial method during storage at 5±2°C and 85±3% relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	65.58±2.90	65.52±2.65 <sup>ab</sup>	64.09±2.97 <sup>b</sup>	64.50±2.98	63.93±2.60	64.25±2.68	64.20±2.63	63.95±2.96	64.33±2.59	64.16±2.48	64.04±2.59
Fomesa	65.58±2.90	66.38±2.12 <sup>a</sup>	66.02±1.98 <sup>a</sup>	66.18±1.97	64.85±2.25	64.89±1.79	65.25±2.09	64.65±2.93	65.23±1.86	65.37±4.92	64.09±1.91
Citrashine	65.58±2.90	64.24±2.63 <sup>b</sup>	63.80±3.01 <sup>b</sup>	64.37±2.37	63.48±2.53	64.04±2.50	63.62±2.66	63.31±3.09	63.57±2.43	63.48±2.54	63.02±2.34
non-coated	65.58±2.90	64.68±2.71 <sup>b</sup>	63.96±2.44 <sup>b</sup>	64.26±2.66	63.91±2.74	64.21±2.69	64.43±2.47	64.55±2.54	64.02±2.79	64.26±2.76	63.79±2.72
LSD <sub>0.05</sub>	1.70	1.60	1.66	1.59	1.60	1.54	1.56	1.82	1.54	2.10	1.52
C.V. (%)	4.10	3.89	4.09	3.89	3.96	3.80	3.84	4.51	3.80	5.12	3.78

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.55** Chroma of tangerine fruit cv. 'Sai Nam Phueng' coated with commercial coatings by commercial method during storage at 5±2°C and 85±3% relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	61.92±6.23	60.86±5.18 <sup>c</sup>	62.47±6.29	64.54±8.07	59.82±6.16 <sup>b</sup>	63.45±6.94 <sup>ab</sup>	60.90±6.11 <sup>ab</sup>	61.29±6.01	63.08±6.04	63.89±5.57	63.59±4.80 <sup>bc</sup>
Fomesa	60.02±6.40	65.25±5.98 <sup>ab</sup>	63.70±5.76	63.74±6.31	64.08±6.91 <sup>ab</sup>	62.94±6.10 <sup>b</sup>	64.50±6.67 <sup>b</sup>	64.15±6.91	65.21±6.59	65.57±6.50	63.86±7.07 <sup>ab</sup>
Citrashine	57.72±7.09	61.47±7.13 <sup>bc</sup>	61.14±7.92	61.23±6.83	60.75±6.26 <sup>b</sup>	59.85±5.25 <sup>b</sup>	61.01±6.89 <sup>b</sup>	63.16±8.26	62.60±6.65	62.76±6.54	59.77±5.82 <sup>c</sup>
non-coated	61.42±4.86	66.21±7.47 <sup>a</sup>	66.43±7.51	67.51±7.11	65.72±7.26 <sup>a</sup>	67.12±7.14 <sup>a</sup>	66.48±6.88 <sup>a</sup>	67.40±6.87	67.26±7.59	68.10±7.00	67.54±6.59 <sup>a</sup>
LSD <sub>0.05</sub>	4.20	4.10	4.37	4.48	4.28	4.04	4.19	4.45	4.25	4.05	3.86
C.V. (%)	11.04	10.26	10.92	11.06	10.84	10.10	10.51	11.03	10.44	9.87	9.62

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.56** Hue angle (degree) of tangerine fruit cv. 'Sai Nam Phueng' coated with commercial coatings by commercial method during storage at 5±2°C and 85±3% relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	77.64±6.11	77.82±6.01	76.33±5.99	75.26±5.69	76.80±5.80	75.67±5.71	76.95±5.73 <sup>ab</sup>	77.30±5.62 <sup>ab</sup>	75.91±5.36 <sup>a</sup>	75.35±5.05 <sup>a</sup>	74.08±5.42 <sup>a</sup>
Fomesa	75.15±6.02	74.18±5.06	72.41±4.98	72.78±5.90	73.54±6.25	74.52±4.86	73.82±5.55 <sup>bc</sup>	74.13±5.31 <sup>bc</sup>	73.04±5.05 <sup>ab</sup>	72.83±4.76 <sup>ab</sup>	72.48±5.27 <sup>ab</sup>
Citrashine	78.46±7.99	77.46±7.71	75.81±8.97	76.39±7.95	77.08±8.06	75.59±6.69	77.94±8.02 <sup>a</sup>	74.48±8.23 <sup>a</sup>	76.71±7.47 <sup>a</sup>	76.29±7.72 <sup>a</sup>	75.78±7.25 <sup>a</sup>
non-coated	74.23±6.56	74.02±6.33	73.68±6.21	72.49±5.17	72.23±6.24	72.30±5.89	72.47±6.22 <sup>c</sup>	72.90±7.12 <sup>c</sup>	71.77±5.71 <sup>b</sup>	71.20±5.35 <sup>b</sup>	70.35±5.13 <sup>b</sup>
LSD <sub>0.05</sub>	4.23	4.00	4.23	3.95	4.19	3.67	4.07	4.21	3.77	3.68	3.68
C.V. (%)	8.82	8.37	8.99	8.44	8.87	7.81	8.57	8.82	8.03	7.91	7.97

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.57** Total soluble solids (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with commercial coatings by commercial method during storage at 5±2°C and 85±3% relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	12.40±0.61	12.17±0.81	13.00±0.17	12.27±0.60 <sup>bc</sup>	12.27±0.25	12.47±0.91	11.93±1.15	12.03±0.90	12.93±0.61 <sup>ab</sup>	12.43±0.12	14.47±0.85
Fomesa	12.40±0.61	12.57±0.76	12.70±0.53	11.67±0.29 <sup>c</sup>	11.27±0.55	12.97±0.12	13.40±0.26	11.57±1.18	13.57±0.29 <sup>a</sup>	12.00±0.78	13.00±0.36
Citrashine	12.40±0.61	12.63±0.32	12.27±0.91	12.63±0.65 <sup>ab</sup>	11.23±0.75	12.23±0.21	12.80±0.30	12.90±0.53	11.03±0.81 <sup>c</sup>	13.00±0.46	13.57±0.90
non-coated	12.40±0.61	12.40±0.95	12.67±1.24	13.20±0.26 <sup>a</sup>	12.93±1.12	13.17±1.01	13.83±0.45	12.53±0.42	11.97±0.06 <sup>bc</sup>	11.83±0.61	12.97±1.07
LSD <sub>0.05</sub>	1.14	1.41	1.54	0.91	1.38	1.30	1.22	1.53	0.99	1.03	1.57
C.V. (%)	4.91	6.03	6.46	3.90	6.18	5.43	5.00	6.65	4.26	4.46	6.69

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.58** Titratable acidity (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with commercial coatings by commercial method during storage at  $5\pm 2^\circ\text{C}$  and  $85\pm 3\%$  relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	0.72±0.04	0.83±0.10	0.72±0.08	0.69±0.03	0.70±0.04	0.68±0.06	0.64±0.02	0.63±0.04	0.65±0.04	0.66±0.02	0.66±0.02
Fomesa	0.72±0.04	0.82±0.11	0.80±0.03	0.69±0.04	0.71±0.03	0.72±0.08	0.77±0.03	0.69±0.06	0.69±0.06	0.66±0.03	0.65±0.11
Citrahine	0.72±0.04	0.90±0.05	0.76±0.12	0.76±0.09	0.71±0.02	0.64±0.04	0.71±0.13	0.68±0.07	0.64±0.00	0.66±0.03	0.65±0.02
non-coated	0.72±0.04	0.78±0.05	0.71±0.05	0.67±0.06	0.66±0.05	0.69±0.06	0.78±0.02	0.65±0.06	0.67±0.03	0.66±0.02	0.65±0.02
LSD <sub>0.05</sub>	0.07	0.15	0.14	0.11	0.07	0.13	0.13	0.11	0.08	0.04	0.33
C.V. (%)	5.01	9.61	10.20	7.21	5.04	10.06	9.31	8.81	6.02	3.03	2.65

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.59** TSS/TA ratio of tangerine fruit cv. 'Sai Nam Phueng' coated with commercial coatings by commercial method during storage at  $5\pm 2^\circ\text{C}$  and  $85\pm 3\%$  relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	17.28±1.18	14.77±8.072	18.22±1.73	17.89±0.76	18.16±0.84	18.60±2.95	18.52±1.60	19.21±2.59	19.81±0.46	18.90±0.56	21.99±1.30
Fomesa	17.28±1.18	15.47±2.25	15.94±1.12	16.95±1.38	15.90±1.09	18.20±1.96	17.32±0.99	16.86±0.50	19.75±1.77	18.10±0.81	19.90±0.75
Citrahine	17.28±1.18	13.99±1.08	16.34±2.43	16.84±2.94	15.84±1.06	19.21±1.56	18.32±3.24	19.03±1.39	17.13±1.26	19.65±1.31	20.94±1.66
non-coated	17.28±1.18	16.00±2.13	17.99±3.02	19.85±1.30	19.83±3.32	19.23±2.75	17.64±0.26	19.43±1.85	17.83±0.82	18.00±1.23	19.85±1.67
LSD <sub>0.05</sub>	2.23	3.16	4.14	4.25	3.53	4.47	3.53	3.30	2.22	1.93	2.63
C.V. (%)	6.85	11.14	12.84	10.02	10.75	12.62	10.46	9.41	6.34	5.50	6.76

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

**Table A.60** pH of tangerine fruit cv. 'Sai Nam Phueng' coated with commercial coatings by commercial method during storage at 5±2°C and 85±3% relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	2.79±0.03	2.73±0.11	2.80±0.03	2.90±0.08	2.97±0.04	2.93±0.10	2.99±0.11	3.05±0.02	3.40±0.03	3.04±0.03	3.07±0.04
Fomesa	2.79±0.03	2.69±0.09	2.72±0.02	2.80±0.04	2.84±0.07	2.82±0.02	2.73±0.05	3.05±0.08	3.03±0.04	3.03±0.03	3.08±0.04
Citrashine	2.79±0.03	2.63±0.01	2.78±0.05	2.84±0.09	2.83±0.06	2.85±0.10	2.83±0.16	3.00±0.09	3.01±0.01	3.03±0.04	3.07±0.03
non-coated	2.79±0.03	2.66±0.07	2.76±0.07	2.83±0.01	2.86±0.17	2.75±0.03	2.67±0.07	3.10±0.06	3.04±0.05	3.03±0.01	3.07±0.06
LSD <sub>0.05</sub>	0.06	0.15	0.09	0.12	0.19	0.13	0.20	0.12	0.06	0.050	0.09
C.V. (%)	1.13	3.08	1.73	2.25	3.46	2.49	3.84	2.15	1.09	0.87	1.49

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.61** Vitamin C content (mg/100 ml juice) of tangerine fruit cv. 'Sai Nam Phueng' coated with commercial coatings by commercial method during storage at 5±2°C and 85±3% relative humidity for 46 days

Treatments	Storage time (days)										
	0	1	6	11	16	21	26	31	36	41	46
Zivdar	21.29±1.94	22.58±2.96	20.51±2.94	20.32±1.10	20.00±1.12	21.93±2.96 <sup>a</sup>	20.00±1.12	18.18±1.13 <sup>b</sup>	18.71±1.11	18.87±1.89	19.23±1.92
Fomesa	21.29±1.94	22.58±1.12	20.51±2.22	20.32±2.91	20.00±2.96	17.42±1.94 <sup>b</sup>	18.71±1.11	18.83±1.13 <sup>b</sup>	17.42±1.94	17.61±2.18	18.59±1.11
Citrashine	21.29±1.94	23.87±1.11	19.87±1.11	20.32±2.20	21.29±1.94	17.42±0.00 <sup>b</sup>	17.42±1.94	17.53±1.95 <sup>b</sup>	20.64±1.12	18.24±1.09	21.15±1.93
non-coated	21.29±1.94	21.93±2.96	20.51±2.22	19.05±0.00	18.71±2.23	20.64±1.12 <sup>ab</sup>	17.42±1.94	21.43±1.95 <sup>a</sup>	18.71±5.59	20.75±1.89	19.23±1.92
LSD <sub>0.05</sub>	3.65	4.21	4.18	3.26	4.08	3.49	2.97	2.34	5.76	3.40	3.30
C.V. (%)	9.11	9.83	10.91	9.53	10.83	9.5	8.59	6.63	16.22	9.58	8.97

Means followed by different superscript letters within a column are significantly different (P≤0.05)

**Table A.62** Weight loss (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature ( $27\pm 3^{\circ}\text{C}$ ) and  $56\pm 11\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	0.00±0.00	0.70±0.06 <sup>d</sup>	1.30±0.08 <sup>d</sup>	1.77±0.10 <sup>d</sup>	2.24±0.18 <sup>d</sup>	2.80±0.18 <sup>c</sup>	3.27±0.19 <sup>d</sup>
Formulation B	0.00±0.00	0.87±0.10 <sup>c</sup>	1.57±0.16 <sup>c</sup>	2.22±0.22 <sup>c</sup>	2.85±0.27 <sup>c</sup>	3.55±0.33 <sup>c</sup>	4.13±0.39 <sup>c</sup>
Formulation C	0.00±0.00	0.90±0.07 <sup>bc</sup>	1.58±0.12 <sup>c</sup>	2.34±0.16 <sup>bc</sup>	2.97±0.20 <sup>bc</sup>	3.66±0.25 <sup>bc</sup>	4.24±0.29 <sup>bc</sup>
Formulation D	0.00±0.00	0.90±0.11 <sup>b</sup>	1.74±0.18 <sup>b</sup>	2.44±0.25 <sup>b</sup>	3.12±0.32 <sup>b</sup>	3.87±0.39 <sup>b</sup>	4.49±0.46 <sup>b</sup>
Zivdar	0.00±0.00	0.96±0.09 <sup>b</sup>	1.66±0.15 <sup>bc</sup>	2.35±0.20 <sup>bc</sup>	2.99±0.24 <sup>bc</sup>	3.69±0.29 <sup>bc</sup>	4.27±0.34 <sup>bc</sup>
non-coated	0.00±0.00	1.78±0.20 <sup>a</sup>	3.00±0.36 <sup>a</sup>	4.35±0.52 <sup>a</sup>	5.53±0.72 <sup>a</sup>	6.96±0.83 <sup>a</sup>	8.15±0.98 <sup>a</sup>
LSD <sub>0.05</sub>	-	0.07	0.12	0.17	0.23	0.27	0.32
C.V. (%)	-	10.10	10.81	10.64	11.35	10.60	10.68

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.62 (continued)** Weight loss (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature ( $27\pm 3^\circ\text{C}$ ) and  $56\pm 11\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Formulation A	3.69±0.21 <sup>d</sup>	4.08±2.04 <sup>d</sup>	4.43±0.27 <sup>c</sup>	4.77±0.29 <sup>d</sup>	5.00±0.31 <sup>d</sup>	5.29±0.33 <sup>d</sup>	5.60±0.35 <sup>d</sup>
Formulation B	4.67±0.43 <sup>c</sup>	5.19±0.48 <sup>c</sup>	5.63±0.52 <sup>c</sup>	6.07±0.56 <sup>c</sup>	6.38±0.59 <sup>c</sup>	6.74±0.62 <sup>c</sup>	7.15±0.66 <sup>c</sup>
Formulation C	4.78±0.32 <sup>bc</sup>	5.30±0.36 <sup>bc</sup>	5.76±0.39 <sup>bc</sup>	6.19±0.41 <sup>bc</sup>	6.51±0.43 <sup>bc</sup>	6.88±0.46 <sup>bc</sup>	7.29±0.48 <sup>b</sup>
Formulation D	5.08±0.51 <sup>b</sup>	5.65±0.57 <sup>b</sup>	6.07±0.62 <sup>b</sup>	6.59±0.66 <sup>b</sup>	6.94±0.69 <sup>b</sup>	7.35±0.74 <sup>b</sup>	7.79±0.78 <sup>b</sup>
Zivdar	4.80±0.42 <sup>bc</sup>	5.37±0.42 <sup>bc</sup>	5.82±0.46 <sup>bc</sup>	6.27±0.49 <sup>bc</sup>	6.60±0.51 <sup>bc</sup>	6.99±0.55 <sup>bc</sup>	7.40±0.58 <sup>bc</sup>
non-coated	9.20±1.08 <sup>a</sup>	10.30±1.19 <sup>a</sup>	11.18±1.29 <sup>a</sup>	12.00±1.37 <sup>a</sup>	12.64±1.43 <sup>a</sup>	13.40±1.51 <sup>a</sup>	14.20±1.58 <sup>a</sup>
LSD <sub>0.05</sub>	0.36	0.39	0.42	0.45	0.47	0.50	0.53
C.V. (%)	10.60	10.46	10.46	10.32	10.26	10.29	10.22

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.63** Internal O<sub>2</sub> (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	15.96±0.90	6.88±0.94 <sup>b</sup>	5.15±2.17 <sup>c</sup>	4.35±1.31 <sup>c</sup>	3.62±1.11 <sup>b</sup>	3.78±1.12 <sup>b</sup>	4.00±0.68 <sup>b</sup>
Formulation B	15.96±0.90	7.10±0.32 <sup>b</sup>	7.25±0.57 <sup>b</sup>	4.28±2.02 <sup>c</sup>	4.91±0.79 <sup>b</sup>	4.06±1.22 <sup>b</sup>	3.42±0.68 <sup>b</sup>
Formulation C	15.96±0.90	7.22±0.78 <sup>b</sup>	7.18±1.19 <sup>b</sup>	6.28±1.14 <sup>b</sup>	4.85±1.73 <sup>b</sup>	3.93±1.08 <sup>b</sup>	3.67±1.46 <sup>b</sup>
Formulation D	15.96±0.90	7.97±1.16 <sup>b</sup>	7.70±0.93 <sup>b</sup>	7.78±0.82 <sup>b</sup>	4.55±0.96 <sup>b</sup>	4.16±0.66 <sup>b</sup>	7.54±1.64 <sup>b</sup>
Zivdar	15.96±0.90	7.96±0.44 <sup>b</sup>	6.07±0.80 <sup>bc</sup>	7.24±0.95 <sup>b</sup>	4.93±2.28 <sup>b</sup>	4.16±0.90 <sup>b</sup>	5.53±1.54 <sup>b</sup>
non-coated	15.96±0.90	15.89±1.18 <sup>a</sup>	14.93±0.91 <sup>a</sup>	16.35±1.50 <sup>a</sup>	14.83±1.60 <sup>a</sup>	15.42±1.39 <sup>a</sup>	13.05±1.13 <sup>a</sup>
LSD <sub>0.05</sub>	1.17	1.09	1.68	1.75	2.18	1.42	1.40
C.V. (%)	5.62	9.28	14.32	16.73	24.82	18.39	17.84

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.63 (continued)** Internal O<sub>2</sub> (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Formulation A	4.00±0.68 <sup>cd</sup>	4.07±0.99 <sup>b</sup>	3.75±0.90 <sup>c</sup>	3.82±2.28 <sup>b</sup>	4.34±1.53 <sup>b</sup>	5.06±1.57 <sup>bc</sup>	3.33±0.90 <sup>c</sup>
Formulation B	3.42±0.85 <sup>d</sup>	5.38±1.03 <sup>b</sup>	4.16±0.93 <sup>bc</sup>	4.38±0.92 <sup>b</sup>	3.95±1.54 <sup>b</sup>	4.19±2.52 <sup>c</sup>	4.19±1.79 <sup>bc</sup>
Formulation C	3.67±1.46 <sup>d</sup>	4.13±0.92 <sup>b</sup>	5.57±1.36 <sup>b</sup>	4.65±1.96 <sup>b</sup>	4.63±1.46 <sup>b</sup>	3.99±1.62 <sup>c</sup>	4.67±2.14 <sup>bc</sup>
Formulation D	7.54±1.64 <sup>b</sup>	5.31±1.66 <sup>b</sup>	5.27±1.11 <sup>bc</sup>	5.56±2.63 <sup>b</sup>	5.75±2.08 <sup>b</sup>	7.20±1.92 <sup>b</sup>	5.97±2.08 <sup>b</sup>
Zivdar	5.53±1.54 <sup>c</sup>	5.53±2.08 <sup>b</sup>	4.91±0.66 <sup>bc</sup>	5.20±0.97 <sup>b</sup>	4.85±1.74 <sup>b</sup>	5.89±0.83 <sup>bc</sup>	5.95±1.23 <sup>b</sup>
non-coated	13.05±1.13 <sup>a</sup>	12.49±1.49 <sup>a</sup>	11.41±1.72 <sup>a</sup>	12.01±3.15 <sup>a</sup>	9.29±3.48 <sup>a</sup>	12.51±2.24 <sup>a</sup>	9.74±1.08 <sup>a</sup>
LSD <sub>0.05</sub>	1.69	2.11	1.52	3.07	2.73	2.43	29.71
C.V. (%)	19.84	23.80	19.93	36.77	38.29	28.79	2.18

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion



**Table A.64** Internal CO<sub>2</sub> (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	4.48±0.87	7.34±1.21 <sup>ab</sup>	8.21±0.60 <sup>a</sup>	8.18±2.25 <sup>a</sup>	8.53±0.86 <sup>a</sup>	9.58±1.43 <sup>ab</sup>	8.00±2.16 <sup>b</sup>
Formulation B	4.48±0.87	7.71±1.29 <sup>a</sup>	7.47±0.82 <sup>ab</sup>	8.04±1.73 <sup>a</sup>	8.13±0.71 <sup>a</sup>	8.80±1.21 <sup>abc</sup>	8.53±1.03 <sup>b</sup>
Formulation C	4.48±0.87	6.31±0.95 <sup>ab</sup>	6.42±0.45 <sup>b</sup>	6.95±0.75 <sup>a</sup>	8.18±1.07 <sup>a</sup>	8.55±0.56 <sup>bc</sup>	11.17±1.37 <sup>a</sup>
Formulation D	4.48±0.87	5.96±1.18 <sup>bc</sup>	6.45±1.41 <sup>b</sup>	7.02±0.76 <sup>a</sup>	7.34±1.86 <sup>a</sup>	9.20±1.97 <sup>ab</sup>	9.25±1.47 <sup>ab</sup>
Zivdar	4.48±0.87	7.45±1.61 <sup>ab</sup>	7.42±0.92 <sup>ab</sup>	7.79±0.75 <sup>a</sup>	8.23±1.30 <sup>a</sup>	10.77±0.96 <sup>a</sup>	11.59±2.13 <sup>a</sup>
non-coated	4.48±0.87	4.58±0.58 <sup>c</sup>	4.55±0.66 <sup>c</sup>	3.96±0.70 <sup>b</sup>	4.64±1.08 <sup>b</sup>	6.92±1.74 <sup>c</sup>	4.51±1.70 <sup>c</sup>
LSD <sub>0.05</sub>	1.14	1.62	1.23	1.72	1.14	2.01	2.51
C.V. (%)	19.42	18.10	12.86	18.46	15.39	15.60	19.66

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.64 (continued)** Internal CO<sub>2</sub> (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Formulation A	10.42±1.79 <sup>ab</sup>	12.89±2.47 <sup>a</sup>	11.70±2.55 <sup>ab</sup>	11.46±1.56 <sup>b</sup>	14.89±2.80 <sup>a</sup>	13.94±1.09 <sup>a</sup>	17.54±2.53 <sup>a</sup>
Formulation B	9.95±0.96 <sup>ab</sup>	10.74±1.39 <sup>b</sup>	10.98±1.13 <sup>ab</sup>	13.47±0.77 <sup>a</sup>	12.96±1.19 <sup>a</sup>	14.66±2.32 <sup>a</sup>	16.67±1.02 <sup>ab</sup>
Formulation C	8.90±0.94 <sup>bc</sup>	10.88±1.09 <sup>ab</sup>	11.57±2.05 <sup>ab</sup>	11.56±1.12 <sup>b</sup>	13.58±1.87 <sup>a</sup>	12.83±3.27 <sup>a</sup>	14.48±1.31 <sup>b</sup>
Formulation D	7.90±1.94 <sup>c</sup>	11.66±1.63 <sup>ab</sup>	10.31±1.99 <sup>b</sup>	10.08±1.06 <sup>b</sup>	14.17±1.59 <sup>a</sup>	12.65±0.97 <sup>a</sup>	14.58±2.64 <sup>b</sup>
Zivdar	11.32±1.29 <sup>a</sup>	12.86±1.43 <sup>a</sup>	12.93±0.82 <sup>a</sup>	13.91±1.96 <sup>a</sup>	14.88±1.30 <sup>a</sup>	13.93±1.42 <sup>a</sup>	17.86±2.63 <sup>a</sup>
non-coated	5.23±0.95 <sup>d</sup>	6.15±0.82 <sup>c</sup>	5.18±0.62 <sup>c</sup>	6.02±1.18 <sup>c</sup>	8.11±1.41 <sup>b</sup>	9.47±1.89 <sup>b</sup>	10.52±1.52 <sup>c</sup>
LSD <sub>0.05</sub>	1.79	2.03	2.20	1.84	2.40	2.60	2.68
C.V. (%)	15.34	14.34	16.12	12.17	13.50	15.41	13.45

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.65** Ethanol content in juice (mg/l) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 11 days

Treatments	Storage time (days)			
	0	3	7	11
Formulation A	151.74±29.22	666.78±35.10 <sup>b</sup>	929.14±120.88 <sup>ab</sup>	1337.57±360.90 <sup>a</sup>
Formulation B	151.74±29.22	880.35±12.03 <sup>a</sup>	942.51±164.14 <sup>a</sup>	1481.28±271.91 <sup>a</sup>
Formulation C	151.74±29.22	889.37±41.11 <sup>a</sup>	728.94±99.27 <sup>ab</sup>	1124.33±299.63 <sup>ab</sup>
Formulation D	151.74±29.22	409.09±14.04 <sup>c</sup>	703.88±30.08 <sup>b</sup>	786.10±318.85 <sup>b</sup>
Zivdar	151.74±29.22	629.68±162.43 <sup>b</sup>	932.49±210.56 <sup>a</sup>	1005.35±257.77 <sup>ab</sup>
non-coated	151.74±29.22	198.53±60.16 <sup>d</sup>	164.44±42.11 <sup>c</sup>	209.23±15.05 <sup>c</sup>
LSD <sub>0.05</sub>	51.97	132.41	227.75	493.60
C.V. (%)	19.26	12.16	17.46	28.02

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.66** Pyruvate decarboxylase activity (units/min/mg protein) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	0.60±0.55	3.06±0.61 <sup>ab</sup>	1.37±1.08	4.67±2.51 <sup>a</sup>	3.88±1.98 <sup>a</sup>	3.35±0.61	7.77±1.80 <sup>a</sup>
Formulation B	0.60±0.55	3.79±1.79 <sup>a</sup>	0.92±0.37	2.77±0.53 <sup>ab</sup>	3.65±1.00 <sup>ab</sup>	3.13±2.18	4.77±1.56 <sup>abc</sup>
Formulation C	0.60±0.55	2.94±1.54 <sup>ab</sup>	1.55±0.47	3.24±0.51 <sup>ab</sup>	1.40±0.28 <sup>ab</sup>	3.83±1.21	6.17±2.99 <sup>ab</sup>
Formulation D	0.60±0.55	1.68±0.79 <sup>b</sup>	1.08±0.05	2.18±1.97 <sup>ab</sup>	1.68±0.71 <sup>ab</sup>	2.30±1.33	3.53±1.79 <sup>bc</sup>
Zivdar	0.60±0.55	1.58±0.39 <sup>b</sup>	0.98±0.57	2.42±1.26 <sup>ab</sup>	1.90±1.01 <sup>ab</sup>	3.49±1.83	7.94±1.79 <sup>a</sup>
non-coated	0.60±0.55	1.16±0.88 <sup>b</sup>	0.83±0.12	1.62±0.85 <sup>b</sup>	0.27±0.20 <sup>b</sup>	1.70±0.76	2.70±0.78 <sup>c</sup>
LSD <sub>0.05</sub>	0.98	1.98	0.99	2.62	3.12	2.54	3.38
C.V. (%)	19.97	47.14	49.65	52.39	42.34	48.24	34.67

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.66 (continued)** Pyruvate decarboxylase activity (units/min/mg protein) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Formulation A	10.01±2.91 <sup>a</sup>	2.15±0.65 <sup>c</sup>	2.82±0.36 <sup>ab</sup>	3.00±1.81	3.07±0.35 <sup>a</sup>	3.36±0.29 <sup>a</sup>	2.01±0.02 <sup>a</sup>
Formulation B	6.81±3.43 <sup>ab</sup>	7.69±1.98 <sup>ab</sup>	2.09±0.70 <sup>ab</sup>	3.40±1.90	2.72±0.44 <sup>ab</sup>	1.18±0.23 <sup>c</sup>	1.91±0.11 <sup>ab</sup>
Formulation C	5.27±3.55 <sup>ab</sup>	6.30±2.11 <sup>ab</sup>	3.79±2.42 <sup>a</sup>	1.25±0.27	3.09±1.89 <sup>a</sup>	2.95±0.21 <sup>ab</sup>	1.82±0.59 <sup>ab</sup>
Formulation D	4.98±1.30 <sup>ab</sup>	6.86±0.33 <sup>ab</sup>	1.21±0.35 <sup>b</sup>	3.52±1.32	2.04±0.50 <sup>ab</sup>	2.00±0.62 <sup>bc</sup>	2.58±0.43 <sup>a</sup>
Zivdar	8.57±3.70 <sup>ab</sup>	9.99±1.51 <sup>a</sup>	1.92±0.72 <sup>ab</sup>	4.14±2.28	2.36±0.77 <sup>ab</sup>	2.13±1.52 <sup>abc</sup>	1.43±0.30 <sup>ab</sup>
non-coated	3.54±1.83 <sup>b</sup>	4.60±2.48 <sup>bc</sup>	2.65±1.85 <sup>ab</sup>	4.02±2.56	1.08±0.66 <sup>b</sup>	1.37±0.43 <sup>c</sup>	0.82±0.17 <sup>b</sup>
LSD <sub>0.05</sub>	5.21	4.06	2.35	4.54	1.64	1.27	1.18
C.V. (%)	44.88	36.45	54.77	39.31	38.77	33.00	37.72

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.67** Alcohol dehydrogenase activity (units/min/mg protein) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	0.23±0.21	0.14±0.07 <sup>ab</sup>	0.90±0.12 <sup>b</sup>	1.12±0.34 <sup>a</sup>	1.58±0.50	1.57±0.48 <sup>ab</sup>	2.32±0.56 <sup>ab</sup>
Formulation B	0.23±0.21	0.20±0.11 <sup>a</sup>	0.74±0.18 <sup>b</sup>	0.94±0.66 <sup>ab</sup>	1.49±0.75	1.54±0.59 <sup>ab</sup>	1.34±0.82 <sup>bc</sup>
Formulation C	0.23±0.21	0.07±0.01 <sup>b</sup>	0.95±0.52 <sup>b</sup>	1.21±0.64 <sup>a</sup>	0.77±0.17	1.79±1.11 <sup>a</sup>	3.15±1.42 <sup>a</sup>
Formulation D	0.23±0.21	0.05±0.05 <sup>b</sup>	0.98±0.16 <sup>b</sup>	0.47±0.30 <sup>ab</sup>	0.93±0.46	0.95±0.35 <sup>ab</sup>	1.93±0.45 <sup>ab</sup>
Zivdar	0.23±0.21	0.11±0.03 <sup>ab</sup>	2.49±0.28 <sup>a</sup>	0.17±0.09 <sup>b</sup>	1.70±1.21	0.92±0.17 <sup>ab</sup>	2.18±0.26 <sup>ab</sup>
non-coated	0.23±0.21	0.06±0.02 <sup>b</sup>	0.78±0.16 <sup>b</sup>	0.61±0.51 <sup>ab</sup>	0.64±0.16	0.74±0.18 <sup>b</sup>	0.39±0.17 <sup>c</sup>
LSD <sub>0.05</sub>	0.37	0.11	0.48	0.83	1.15	1.03	1.36
C.V. (%)	20.63	44.22	23.89	52.34	54.80	46.08	40.54

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.67 (continued)** Alcohol dehydrogenase activity (units/min/mg protein) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)												
	7	8	9	10	11	12	13	13	13	13	13	13	
Formulation A	5.96±2.37 <sup>a</sup>	2.41±1.05 <sup>a</sup>	1.98±0.54 <sup>ab</sup>	1.49±1.34	1.65±0.95 <sup>cd</sup>	1.38±0.50 <sup>ab</sup>	1.92±0.16						
Formulation B	2.09±0.35 <sup>b</sup>	2.13±0.55 <sup>ab</sup>	4.05±1.11 <sup>a</sup>	1.62±0.70	1.61±0.18 <sup>cd</sup>	0.65±0.44 <sup>b</sup>	4.39±3.75						
Formulation C	2.12±0.88 <sup>b</sup>	1.34±0.66 <sup>abc</sup>	2.00±1.90 <sup>ab</sup>	1.56±0.71	3.52±1.94 <sup>bc</sup>	1.54±0.71 <sup>ab</sup>	1.09±0.19						
Formulation D	1.62±0.65 <sup>b</sup>	1.17±0.37 <sup>bc</sup>	0.87±0.11 <sup>b</sup>	1.21±0.88	4.31±0.99 <sup>ab</sup>	1.46±0.22 <sup>ab</sup>	3.11±2.10						
Zivdar	2.27±0.30 <sup>b</sup>	1.11±0.35 <sup>bc</sup>	3.11±1.76 <sup>a</sup>	2.04±0.39	5.70±0.76 <sup>a</sup>	1.91±0.97 <sup>a</sup>	4.15±1.04						
non-coated	0.65±0.22 <sup>b</sup>	0.79±0.66 <sup>c</sup>	0.72±0.53 <sup>b</sup>	0.62±0.42	1.44±1.25 <sup>d</sup>	1.72±0.57 <sup>ab</sup>	2.77±1.80						
LSD <sub>0.05</sub>	1.93	1.16	2.12	42.17	2.03	1.09	3.47						
C.V. (%)	44.22	43.64	56.19	1.83	37.53	42.54	47.24						

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.68** Flavor score of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	4.00±0.00	4.00±0.00	4.00±0.00	3.67±0.52	3.67±0.52	3.67±0.52 <sup>a</sup>	4.00±0.00 <sup>a</sup>
Formulation B	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	3.67±0.52	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>
Formulation C	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00 <sup>a</sup>	3.50±0.58 <sup>b</sup>
Formulation D	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>
Zivdar	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	3.33±0.52 <sup>c</sup>	4.00±0.00 <sup>a</sup>
non-coated	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>
LSD <sub>0.05</sub>	-	-	-	0.25	0.35	0.35	0.35
C.V. (%)	-	-	-	5.34	7.67	7.78	6.04

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

Evaluation of flavor by tasting, using a scale of 1 to 4 where 4 = excellent, 3 = slightly off-flavor, 2 = moderately off-flavor and 1 = extremely off-flavor. Fruit taste was rated "unacceptable" when the taste score was below three



**Table A.68 (continued)** Flavor score of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature ( $27\pm 3^{\circ}\text{C}$ ) and  $56\pm 11\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Formulation A	3.00±0.00 <sup>b</sup>	3.00±1.15 <sup>b</sup>	3.33±1.03 <sup>b</sup>	3.00±0.89 <sup>b</sup>	3.00±0.89 <sup>b</sup>	2.00±0.00 <sup>d</sup>	3.00±0.89 <sup>b</sup>
Formulation B	4.00±0.00 <sup>a</sup>	3.50±0.58 <sup>ab</sup>	3.33±0.52 <sup>b</sup>	3.67±0.89 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.00±0.89 <sup>c</sup>	3.67±0.52 <sup>ab</sup>
Formulation C	3.67±0.52 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.67±0.52 <sup>ab</sup>	4.00±0.00 <sup>a</sup>
Formulation D	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.33±0.52 <sup>ab</sup>
Zivdar	3.67±0.52 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.33±0.52 <sup>b</sup>	3.33±0.52 <sup>bc</sup>	3.33±1.03 <sup>ab</sup>
non-coated	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>
LSD <sub>0.05</sub>	0.35	0.78	0.61	0.50	0.50	0.56	0.75
C.V. (%)	8.01	14.06	13.87	11.16	11.33	14.15	17.79

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

Evaluation of flavor by tasting, using a scale of 1 to 4 where 4 = excellent, 3 = slightly off-flavor, 2 = moderately off-flavor and 1 = extremely off-flavor. Fruit taste was rated "unacceptable" when the taste score was below three.

**Table A.69** Visual appearance score of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	5.00±0.00	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>
Formulation B	5.00±0.00	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.50±0.58 <sup>a</sup>
Formulation C	5.00±0.00	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.50±0.58 <sup>a</sup>
Formulation D	5.00±0.00	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.50±0.58 <sup>a</sup>
Zivdar	5.00±0.00	5.00±0.00	5.00±0.00	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	5.00±0.00 <sup>a</sup>	4.50±0.58 <sup>a</sup>
non-coated	5.00±0.00	5.00±0.00	5.00±0.00	4.00±0.00 <sup>b</sup>	4.00±0.00 <sup>b</sup>	3.67±0.52 <sup>b</sup>	2.50±0.58 <sup>b</sup>
LSD <sub>0.05</sub>	-	-	-	0.23	0.23	0.25	0.78
C.V. (%)	-	-	-	0.00	0.00	4.41	12.40

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed t coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

Evaluation of visual appearance (wilting and shriveling), using a scale of 1 to 5 where 5 = excellent, 4 = good, 3 = fair, 2 = poor and 1 = unusable. Fruit appearance was rated "unacceptable" when the score was below three.

**Table A.69 (continued)** Visual appearance score of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature ( $27\pm 3^{\circ}\text{C}$ ) and  $56\pm 11\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Formulation A	4.67±0.52 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>
Formulation B	4.33±0.52 <sup>ab</sup>	4.00±0.00 <sup>a</sup>	3.67±0.52 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.33±0.52 <sup>b</sup>	3.67±0.52 <sup>ab</sup>	3.00±0.00 <sup>a</sup>
Formulation C	4.00±0.00 <sup>b</sup>	3.50±0.58 <sup>b</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.33±0.52 <sup>b</sup>	3.67±0.52 <sup>ab</sup>	3.00±0.00 <sup>a</sup>
Formulation D	4.33±0.52 <sup>ab</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	4.00±0.00 <sup>a</sup>	3.00±0.00 <sup>b</sup>	3.33±0.52 <sup>bc</sup>	3.00±0.00 <sup>a</sup>
Zivdar	4.00±0.00 <sup>b</sup>	3.50±0.58 <sup>b</sup>	4.00±0.00 <sup>a</sup>	3.33±0.52 <sup>b</sup>	3.00±0.00 <sup>b</sup>	3.17±0.41 <sup>c</sup>	2.67±0.52 <sup>b</sup>
non-coated	2.00±0.00 <sup>c</sup>	2.00±0.00 <sup>c</sup>	1.67±0.52 <sup>b</sup>	1.00±0.00 <sup>c</sup>	1.00±0.00 <sup>c</sup>	1.00±0.00 <sup>d</sup>	1.00±0.00 <sup>c</sup>
LSD <sub>0.05</sub>	0.43	0.50	0.35	0.25	0.35	0.47	0.25
C.V. (%)	9.39	9.52	8.38	6.22	10.13	12.79	7.59

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

Evaluation of visual appearance (wilting and shriveling), using a scale of 1 to 5 where 5 = excellent, 4 = good, 3 = fair, 2 = poor and 1 = unusable. Fruit appearance was rated "unacceptable" when the score was below three.

**Table A.70** L\* of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	51.60±3.69	51.24±3.82	51.06±3.83	50.82±3.78	50.88±3.64	50.91±3.72	50.74±3.80
Formulation B	50.04±2.13	50.01±2.73	49.81±2.96	49.33±2.41	49.70±2.56	49.52±2.83	49.37±2.70
Formulation C	49.64±2.13	50.04±2.26	49.03±2.16	50.29±3.17	49.16±2.53	49.21±2.43	49.02±2.13
Formulation D	49.50±2.77	49.81±2.84	49.03±2.59	49.05±2.67	48.91±2.75	49.27±2.72	48.39±2.66
Zivdar	49.61±2.19	49.66±2.19	49.01±2.25	49.43±2.10	49.02±2.10	49.26±2.13	48.92±2.17
non-coated	48.79±2.52	49.38±2.92	48.60±2.97	48.72±2.56	48.80±2.62	48.72±2.89	48.30±2.68
LSD <sub>0.05</sub>	1.70	1.78	1.78	1.78	1.73	1.77	1.72
C.V. (%)	5.44	5.69	5.77	5.72	5.58	5.72	5.59

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.70 (continued)** L\* of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Formulation A	50.38±3.62	50.23±3.77	49.91±3.74	49.55±3.63	49.13±3.69	49.50±3.64	49.05±3.48 <sup>ab</sup>
Formulation B	48.89±2.80	48.98±2.87	48.78±2.85	48.01±2.86	48.39±2.87	48.35±2.93	47.96±3.01 <sup>bc</sup>
Formulation C	48.42±2.34	48.41±2.27	47.95±2.19	47.49±2.20	47.51±2.28	47.38±2.15	47.29±2.27 <sup>bc</sup>
Formulation D	48.03±2.68	48.23±2.70	47.98±2.65	47.40±2.82	47.15±2.74	47.54±2.71	47.23±2.52 <sup>c</sup>
Zivdar	48.77±2.21	48.93±2.17	48.63±2.20	47.95±2.33	47.92±2.11	47.93±2.15	47.82±2.59 <sup>bc</sup>
non-coated	48.30±3.03	48.12±3.07	48.67±3.11	48.45±3.39	49.05±3.42	49.45±3.42	49.94±3.18 <sup>a</sup>
LSD <sub>0.05</sub>	1.76	1.79	1.78	1.83	1.82	1.81	1.80
C.V. (%)	5.77	5.86	5.84	6.06	6.03	5.98	5.96

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.71** Chroma of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature ( $27\pm 3^{\circ}\text{C}$ ) and  $56\pm 11\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	43.39 $\pm$ 4.90 <sup>a</sup>	42.63 $\pm$ 5.47	42.76 $\pm$ 5.43	42.62 $\pm$ 4.96	42.92 $\pm$ 5.01 <sup>a</sup>	42.56 $\pm$ 5.40 <sup>a</sup>	42.48 $\pm$ 4.58 <sup>a</sup>
Formulation B	41.41 $\pm$ 4.02 <sup>ab</sup>	41.72 $\pm$ 4.60	40.76 $\pm$ 4.15	40.14 $\pm$ 3.32	40.48 $\pm$ 4.23 <sup>abc</sup>	40.45 $\pm$ 4.26 <sup>ab</sup>	40.60 $\pm$ 4.16 <sup>abc</sup>
Formulation C	40.64 $\pm$ 2.91 <sup>b</sup>	42.63 $\pm$ 5.49	39.85 $\pm$ 3.14	41.55 $\pm$ 4.64	39.84 $\pm$ 3.61 <sup>bc</sup>	39.65 $\pm$ 3.40 <sup>b</sup>	39.28 $\pm$ 3.22 <sup>c</sup>
Formulation D	40.83 $\pm$ 3.61 <sup>b</sup>	40.52 $\pm$ 4.09	39.89 $\pm$ 3.69	39.88 $\pm$ 3.84	39.83 $\pm$ 4.11 <sup>bc</sup>	39.78 $\pm$ 3.67 <sup>b</sup>	39.02 $\pm$ 4.30 <sup>c</sup>
Zivdar	40.01 $\pm$ 3.52 <sup>b</sup>	39.41 $\pm$ 3.27	39.63 $\pm$ 3.44	39.70 $\pm$ 3.14	38.36 $\pm$ 3.56 <sup>c</sup>	39.06 $\pm$ 3.15 <sup>b</sup>	39.04 $\pm$ 3.25 <sup>bc</sup>
non-coated	39.42 $\pm$ 3.95 <sup>b</sup>	40.91 $\pm$ 3.84	40.69 $\pm$ 3.78	41.12 $\pm$ 3.24	40.99 $\pm$ 3.41 <sup>ab</sup>	41.19 $\pm$ 4.16 <sup>ab</sup>	41.16 $\pm$ 3.84 <sup>ab</sup>
LSD <sub>0.05</sub>	2.42	2.84	2.51	2.46	2.52	2.55	2.46
C.V. (%)	9.44	10.98	9.87	9.61	9.96	10.07	9.75

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.71 (continued)** Chroma of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature ( $27\pm 3^{\circ}\text{C}$ ) and  $56\pm 11\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Formulation A	41.78 $\pm$ 5.07 <sup>a</sup>	41.90 $\pm$ 5.25 <sup>a</sup>	41.10 $\pm$ 5.06 <sup>ab</sup>	40.01 $\pm$ 5.16 <sup>ab</sup>	39.96 $\pm$ 5.50 <sup>b</sup>	40.48 $\pm$ 4.83 <sup>b</sup>	40.31 $\pm$ 4.91 <sup>b</sup>
Formulation B	40.15 $\pm$ 4.01 <sup>abc</sup>	39.70 $\pm$ 3.73 <sup>ab</sup>	39.52 $\pm$ 4.35 <sup>bc</sup>	38.12 $\pm$ 3.68 <sup>bc</sup>	38.42 $\pm$ 4.38 <sup>bc</sup>	38.76 $\pm$ 4.22 <sup>bc</sup>	38.00 $\pm$ 4.29 <sup>bc</sup>
Formulation C	38.52 $\pm$ 3.31 <sup>c</sup>	38.44 $\pm$ 3.28 <sup>b</sup>	38.44 $\pm$ 3.14 <sup>c</sup>	36.68 $\pm$ 2.80 <sup>c</sup>	37.42 $\pm$ 3.47 <sup>bc</sup>	37.22 $\pm$ 3.28 <sup>c</sup>	37.11 $\pm$ 3.48 <sup>c</sup>
Formulation D	38.55 $\pm$ 3.76 <sup>c</sup>	38.94 $\pm$ 3.71 <sup>b</sup>	38.13 $\pm$ 4.08 <sup>c</sup>	36.79 $\pm$ 3.71 <sup>c</sup>	36.91 $\pm$ 3.96 <sup>c</sup>	37.43 $\pm$ 4.23 <sup>c</sup>	36.77 $\pm$ 3.71 <sup>c</sup>
Zivdar	38.85 $\pm$ 3.58 <sup>bc</sup>	38.73 $\pm$ 3.70 <sup>b</sup>	38.15 $\pm$ 3.64 <sup>c</sup>	37.83 $\pm$ 3.90 <sup>bc</sup>	36.94 $\pm$ 3.59 <sup>c</sup>	37.22 $\pm$ 3.29 <sup>c</sup>	37.16 $\pm$ 4.14 <sup>c</sup>
non-coated	41.19 $\pm$ 3.98 <sup>ab</sup>	41.46 $\pm$ 3.95 <sup>a</sup>	42.20 $\pm$ 4.25 <sup>a</sup>	42.07 $\pm$ 4.56 <sup>a</sup>	42.77 $\pm$ 4.62 <sup>a</sup>	43.62 $\pm$ 4.59 <sup>a</sup>	44.23 $\pm$ 4.35 <sup>a</sup>
LSD <sub>0.05</sub>	2.50	2.50	2.59	2.53	2.70	2.58	2.61
C.V. (%)	10.01	10.00	10.42	10.46	11.12	10.52	10.71

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.72** Hue angle (degree) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature ( $27\pm 3^{\circ}\text{C}$ ) and  $56\pm 11\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	115.01 $\pm$ 3.68	115.69 $\pm$ 3.53	115.35 $\pm$ 3.57	115.71 $\pm$ 3.66	115.23 $\pm$ 3.58 <sup>bc</sup>	115.34 $\pm$ 3.63	114.96 $\pm$ 3.67
Formulation B	116.17 $\pm$ 2.67	116.27 $\pm$ 2.50	116.22 $\pm$ 2.64	117.01 $\pm$ 2.72	116.24 $\pm$ 2.56 <sup>abc</sup>	116.47 $\pm$ 2.59	115.68 $\pm$ 2.92
Formulation C	117.08 $\pm$ 2.51	117.05 $\pm$ 2.55	117.13 $\pm$ 2.74	115.58 $\pm$ 3.57	116.85 $\pm$ 2.76 <sup>ab</sup>	117.19 $\pm$ 2.79	116.70 $\pm$ 2.66
Formulation D	117.38 $\pm$ 1.94	117.52 $\pm$ 2.38	117.68 $\pm$ 1.77	117.82 $\pm$ 1.98	117.44 $\pm$ 1.94 <sup>a</sup>	117.74 $\pm$ 1.72	117.44 $\pm$ 2.08
Zivdar	116.86 $\pm$ 2.64	116.63 $\pm$ 2.86	116.93 $\pm$ 2.45	116.89 $\pm$ 2.55	116.96 $\pm$ 3.06 <sup>ab</sup>	117.05 $\pm$ 2.84	116.30 $\pm$ 2.95
non-coated	117.14 $\pm$ 2.63	116.72 $\pm$ 3.22	116.46 $\pm$ 3.24	116.29 $\pm$ 3.37	114.64 $\pm$ 4.31 <sup>c</sup>	115.76 $\pm$ 3.60	115.21 $\pm$ 3.52
LSD <sub>0.05</sub>	1.71	1.80	1.75	1.90	1.96	1.84	1.89
C.V. (%)	2.34	2.46	2.40	2.60	2.70	2.52	2.60

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion



**Table A.72 (continued)** Hue angle (degree) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature ( $27\pm 3^{\circ}\text{C}$ ) and  $56\pm 11\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Formulation A	114.91 $\pm$ 3.65 <sup>b</sup>	114.57 $\pm$ 3.72 <sup>bc</sup>	114.49 $\pm$ 3.69 <sup>b</sup>	112.78 $\pm$ 3.70 <sup>b</sup>	113.19 $\pm$ 3.61 <sup>b</sup>	113.39 $\pm$ 3.82 <sup>b</sup>	113.26 $\pm$ 3.57 <sup>b</sup>
Formulation B	115.63 $\pm$ 2.90 <sup>ab</sup>	115.69 $\pm$ 2.76 <sup>ab</sup>	115.11 $\pm$ 2.85 <sup>ab</sup>	113.59 $\pm$ 2.64 <sup>ab</sup>	113.68 $\pm$ 3.14 <sup>ab</sup>	114.13 $\pm$ 3.05 <sup>ab</sup>	113.82 $\pm$ 3.24 <sup>ab</sup>
Formulation C	116.86 $\pm$ 2.84 <sup>a</sup>	116.61 $\pm$ 2.64 <sup>ab</sup>	116.12 $\pm$ 2.72 <sup>ab</sup>	114.68 $\pm$ 2.68 <sup>ab</sup>	114.48 $\pm$ 2.88 <sup>ab</sup>	115.34 $\pm$ 2.74 <sup>ab</sup>	114.71 $\pm$ 2.79 <sup>ab</sup>
Formulation D	117.50 $\pm$ 1.96 <sup>a</sup>	117.02 $\pm$ 1.89 <sup>a</sup>	116.59 $\pm$ 2.26 <sup>a</sup>	115.24 $\pm$ 2.23 <sup>a</sup>	115.38 $\pm$ 2.12 <sup>a</sup>	115.75 $\pm$ 2.25 <sup>a</sup>	115.44 $\pm$ 1.97 <sup>a</sup>
Zivdar	116.22 $\pm$ 2.69 <sup>ab</sup>	115.75 $\pm$ 3.08 <sup>ab</sup>	115.41 $\pm$ 2.93 <sup>ab</sup>	113.85 $\pm$ 3.12 <sup>ab</sup>	114.03 $\pm$ 3.01 <sup>ab</sup>	114.65 $\pm$ 2.94 <sup>ab</sup>	113.87 $\pm$ 3.21 <sup>ab</sup>
non-coated	114.73 $\pm$ 3.99 <sup>b</sup>	114.02 $\pm$ 3.92 <sup>c</sup>	112.71 $\pm$ 4.35 <sup>c</sup>	110.69 $\pm$ 4.42 <sup>c</sup>	109.88 $\pm$ 4.63 <sup>c</sup>	110.13 $\pm$ 4.50 <sup>c</sup>	108.58 $\pm$ 4.78 <sup>c</sup>
LSD <sub>0.05</sub>	1.93	1.93	2.01	2.01	2.09	2.07	2.11
C.V. (%)	2.65	2.66	2.79	2.84	2.93	2.90	2.97

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.73** Total soluble solids (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature ( $27\pm 3^{\circ}\text{C}$ ) and  $56\pm 11\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	11.57 $\pm$ 0.15	11.47 $\pm$ 0.06	11.17 $\pm$ 0.65	11.20 $\pm$ 0.85	11.50 $\pm$ 0.56	11.40 $\pm$ 0.61	11.33 $\pm$ 0.51 <sup>b</sup>
Formulation B	11.57 $\pm$ 0.15	11.37 $\pm$ 0.42	11.53 $\pm$ 0.55	11.77 $\pm$ 0.12	11.50 $\pm$ 0.10	10.70 $\pm$ 0.95	11.70 $\pm$ 0.10 <sup>ab</sup>
Formulation C	11.57 $\pm$ 0.15	12.00 $\pm$ 1.04	11.03 $\pm$ 0.23	12.17 $\pm$ 0.71	11.67 $\pm$ 0.21	11.07 $\pm$ 0.65	11.13 $\pm$ 0.57 <sup>b</sup>
Formulation D	11.57 $\pm$ 0.15	12.03 $\pm$ 1.07	11.10 $\pm$ 0.40	12.17 $\pm$ 0.67	12.17 $\pm$ 0.21	11.70 $\pm$ 0.36	11.77 $\pm$ 0.40 <sup>ab</sup>
Zivdar	11.57 $\pm$ 0.15	12.00 $\pm$ 0.26	11.70 $\pm$ 0.36	12.40 $\pm$ 0.17	11.90 $\pm$ 0.80	11.57 $\pm$ 0.42	11.77 $\pm$ 0.31 <sup>ab</sup>
non-coated	11.57 $\pm$ 0.15	11.07 $\pm$ 0.31	11.47 $\pm$ 0.60	11.53 $\pm$ 0.40	12.30 $\pm$ 0.79	11.30 $\pm$ 0.50	12.27 $\pm$ 0.12 <sup>a</sup>
LSD <sub>0.05</sub>	0.27	1.16	0.87	1.00	0.94	1.09	0.68
C.V. (%)	1.32	5.61	4.31	4.72	4.46	5.43	3.26

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.73 (continued)** Total soluble solids (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Formulation A	11.00±0.20 <sup>c</sup>	12.00±0.60	11.47±0.15 <sup>bc</sup>	11.67±0.51	12.10±0.44	12.00±0.85	12.87±0.51 <sup>a</sup>
Formulation B	11.67±0.25 <sup>abc</sup>	11.63±0.87	11.10±0.17 <sup>c</sup>	12.23±0.61	11.73±0.21	12.50±0.36	12.50±0.82 <sup>ab</sup>
Formulation C	11.30±0.56 <sup>bc</sup>	11.80±0.26	11.33±0.42 <sup>c</sup>	12.13±0.59	11.73±0.85	12.37±0.15	10.90±0.17 <sup>d</sup>
Formulation D	11.87±0.06 <sup>ab</sup>	11.80±0.10	11.97±0.12 <sup>b</sup>	12.20±0.10	11.63±0.40	11.83±0.38	11.43±0.29 <sup>cd</sup>
Zivdar	11.80±0.36 <sup>ab</sup>	11.67±0.40	12.50±0.10 <sup>a</sup>	12.07±0.29	12.37±0.31	12.87±0.15	11.90±0.69 <sup>bc</sup>
non-coated	12.20±0.61 <sup>a</sup>	12.63±0.38	11.97±0.50 <sup>b</sup>	12.40±0.10	11.83±0.38	12.30±0.50	12.33±0.40 <sup>abc</sup>
LSD <sub>0.05</sub>	0.70	0.89	0.51	0.76	0.85	0.83	0.94
C.V. (%)	3.36	4.21	2.47	3.51	4.00	3.75	4.43

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.74** Titratable acidity (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	0.82±0.10	0.98±0.12	0.85±0.13	0.96±0.12	0.91±0.10	0.89±0.07	0.83±0.11
Formulation B	0.82±0.10	0.82±0.03	0.89±0.11	0.82±0.03	0.99±0.12	0.79±0.20	0.82±0.10
Formulation C	0.82±0.10	0.86±0.05	0.70±0.12	0.82±0.04	0.78±0.07	0.86±0.10	0.91±0.09
Formulation D	0.82±0.10	1.00±0.07	0.81±0.06	0.94±0.12	0.86±0.07	0.84±0.03	1.00±0.08
Zivdar	0.82±0.10	0.84±0.07	0.99±0.09	0.80±0.22	0.89±0.10	0.81±0.04	0.83±0.07
non-coated	0.82±0.10	0.85±0.15	0.72±0.12	0.76±0.13	0.94±0.10	0.89±0.04	0.90±0.16
LSD <sub>0.05</sub>	0.18	0.16	0.19	0.22	0.17	0.17	0.19
C.V. (%)	12.14	10.11	12.92	15.34	10.59	11.40	12.02

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.74 (continued)** Titratable acidity (%) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature ( $27\pm 3^{\circ}\text{C}$ ) and  $56\pm 11\%$  relative humidity for 13 days

Treatments	Storage time (days)												
	7	8	9	10	11	12	13	10	11	12	13	13	
Formulation A	0.71±0.13 <sup>c</sup>	0.79±0.09 <sup>bc</sup>	0.87±0.05	0.90±0.14	0.88±0.01	0.95±0.16	0.78±0.05	0.90±0.14	0.88±0.01	0.95±0.16	0.78±0.05	0.78±0.05	
Formulation B	0.95±0.03 <sup>b</sup>	0.73±0.08 <sup>c</sup>	0.78±0.13	0.82±0.08	0.82±0.15	0.83±0.11	0.89±0.08	0.82±0.08	0.82±0.15	0.83±0.11	0.89±0.08	0.89±0.08	
Formulation C	0.81±0.05 <sup>bc</sup>	0.80±0.02 <sup>bc</sup>	0.87±0.07	0.75±0.06	0.88±0.09	0.83±0.05	0.74±0.09	0.75±0.06	0.88±0.09	0.83±0.05	0.74±0.09	0.74±0.09	
Formulation D	0.84±0.14 <sup>bc</sup>	0.87±0.08 <sup>ab</sup>	0.92±0.07	0.95±0.06	0.90±0.08	0.78±0.05	0.96±0.13	0.95±0.06	0.90±0.08	0.78±0.05	0.96±0.13	0.96±0.13	
Zivdar	1.11±0.03 <sup>a</sup>	0.80±0.06 <sup>bc</sup>	0.99±0.04	0.90±0.14	0.87±0.08	0.99±0.08	0.84±0.11	0.90±0.14	0.87±0.08	0.99±0.08	0.84±0.11	0.84±0.11	
non-coated	0.95±0.04 <sup>b</sup>	0.96±0.08 <sup>a</sup>	0.98±0.09	0.94±0.04	1.10±0.12	0.92±0.02	0.93±0.12	0.94±0.04	1.10±0.12	0.92±0.02	0.93±0.12	0.93±0.12	
LSD <sub>0.05</sub>	0.15	0.13	0.14	0.17	0.17	0.16	0.18	0.17	0.17	0.16	0.18	0.18	
C.V. (%)	9.57	8.84	8.67	10.87	10.85	10.32	11.62	10.87	10.85	10.32	11.62	11.62	

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

4 developed coatings:

- Formulation A : 8% candellilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.75** TSS/TA ratio of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature ( $27\pm 3^{\circ}\text{C}$ ) and  $56\pm 11\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	14.22 $\pm$ 1.92	11.83 $\pm$ 1.30	13.30 $\pm$ 1.60	14.98 $\pm$ 1.40	12.74 $\pm$ 2.12	12.81 $\pm$ 1.48	13.77 $\pm$ 1.10
Formulation B	14.22 $\pm$ 1.92	13.89 $\pm$ 0.76	13.15 $\pm$ 1.97	14.37 $\pm$ 0.42	11.77 $\pm$ 1.58	14.06 $\pm$ 2.76	14.51 $\pm$ 1.98
Formulation C	14.22 $\pm$ 1.92	14.09 $\pm$ 1.83	16.00 $\pm$ 2.50	14.81 $\pm$ 0.59	15.04 $\pm$ 1.32	13.01 $\pm$ 1.17	12.37 $\pm$ 1.47
Formulation D	14.22 $\pm$ 1.92	12.10 $\pm$ 1.54	13.79 $\pm$ 0.80	13.10 $\pm$ 1.53	14.16 $\pm$ 1.13	13.87 $\pm$ 0.77	11.86 $\pm$ 1.19
Zivdar	14.22 $\pm$ 1.92	14.31 $\pm$ 0.87	11.89 $\pm$ 1.16	16.31 $\pm$ 4.81	13.36 $\pm$ 1.15	14.35 $\pm$ 1.14	14.29 $\pm$ 0.79
non-coated	14.22 $\pm$ 1.92	13.24 $\pm$ 2.29	16.12 $\pm$ 1.97	15.32 $\pm$ 2.06	13.21 $\pm$ 1.97	12.77 $\pm$ 0.92	13.94 $\pm$ 2.54
LSD <sub>0.05</sub>	3.41	2.72	3.13	4.12	2.83	2.71	2.89
C.V. (%)	13.49	11.53	12.53	15.64	11.88	11.31	12.07

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

4 development coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.75 (continued)** TSS/TA ratio of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature ( $27\pm 3^{\circ}\text{C}$ ) and  $56\pm 11\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Formulation A	15.87 $\pm$ 2.43 <sup>a</sup>	15.22 $\pm$ 1.92	13.30 $\pm$ 0.93	13.13 $\pm$ 1.67 <sup>bc</sup>	13.78 $\pm$ 0.53	12.73 $\pm$ 1.32	16.56 $\pm$ 1.75 <sup>a</sup>
Formulation B	12.24 $\pm$ 0.20 <sup>bc</sup>	16.17 $\pm$ 1.27	14.46 $\pm$ 2.60	15.01 $\pm$ 0.71 <sup>ab</sup>	14.63 $\pm$ 2.65	15.32 $\pm$ 2.16	14.20 $\pm$ 0.88 <sup>abc</sup>
Formulation C	14.08 $\pm$ 1.22 <sup>ab</sup>	14.78 $\pm$ 0.48	13.05 $\pm$ 1.27	16.31 $\pm$ 0.48 <sup>a</sup>	13.53 $\pm$ 2.35	14.99 $\pm$ 0.78	14.92 $\pm$ 1.57 <sup>ab</sup>
Formulation D	14.48 $\pm$ 2.31 <sup>ab</sup>	13.64 $\pm$ 1.17	13.09 $\pm$ 1.08	12.83 $\pm$ 0.65 <sup>c</sup>	13.03 $\pm$ 1.54	15.13 $\pm$ 0.53	12.04 $\pm$ 1.76 <sup>c</sup>
Zivdar	10.64 $\pm$ 0.04 <sup>c</sup>	14.75 $\pm$ 1.46	12.68 $\pm$ 0.39	13.48 $\pm$ 1.68 <sup>bc</sup>	14.29 $\pm$ 1.33	13.14 $\pm$ 0.98	14.34 $\pm$ 1.36 <sup>abc</sup>
non-coated	12.91 $\pm$ 0.93 <sup>bc</sup>	13.26 $\pm$ 1.12	12.23 $\pm$ 0.58	13.21 $\pm$ 0.56 <sup>bc</sup>	11.74 $\pm$ 0.98	13.40 $\pm$ 0.56	13.35 $\pm$ 1.22 <sup>bc</sup>
LSD <sub>0.05</sub>	2.68	2.33	2.39	1.93	3.07	2.13	2.59
C.V. (%)	11.26	8.95	10.25	7.77	12.79	8.47	10.23

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.76** pH of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	3.18±0.11	3.03±0.10	3.14±0.08	3.23±0.12	3.30±0.12	3.19±0.08 <sup>bc</sup>	3.24±0.14
Formulation B	3.18±0.11	3.10±0.08	3.20±0.07	3.30±0.01	3.27±0.06	3.33±0.12 <sup>a</sup>	3.24±0.10
Formulation C	3.18±0.11	3.10±0.05	3.30±0.07	3.21±0.05	3.28±0.11	3.23±0.06 <sup>abc</sup>	3.12±0.04
Formulation D	3.18±0.11	3.07±0.11	3.28±0.10	3.20±0.09	3.30±0.05	3.27±0.05 <sup>ab</sup>	3.06±0.04
Zivdar	3.18±0.11	3.09±0.03	3.09±0.14	3.26±0.11	3.23±0.16	3.14±0.03 <sup>c</sup>	3.17±0.06
non-coated	3.18±0.11	3.10±0.06	3.23±0.09	3.29±0.15	3.15±0.10	3.14±0.02 <sup>c</sup>	3.15±0.14
LSD <sub>0.05</sub>	0.20	0.13	0.17	0.17	0.19	0.12	0.17
C.V. (%)	3.57	2.47	2.93	3.00	3.28	2.11	2.98

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion



**Table A.76 (continued)** pH of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature ( $27\pm 3^{\circ}\text{C}$ ) and  $56\pm 11\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Formulation A	3.30±0.19	3.24±0.11 <sup>a</sup>	3.14±0.10	3.23±0.08 <sup>abc</sup>	3.24±0.03	3.19±0.18	3.33±0.07
Formulation B	3.21±0.04	3.34±0.05 <sup>a</sup>	3.28±0.10	3.33±0.03 <sup>ab</sup>	3.32±0.16	3.32±0.16	3.38±0.12
Formulation C	3.29±0.11	3.35±0.02 <sup>a</sup>	3.27±0.10	3.34±0.03 <sup>a</sup>	3.24±0.02	3.23±0.10	3.49±0.13
Formulation D	3.18±0.04	3.27±0.09 <sup>a</sup>	3.19±0.03	3.22±0.06 <sup>bc</sup>	3.22±0.13	3.36±0.02	3.48±0.37
Zivdar	3.18±0.05	3.29±0.09 <sup>a</sup>	3.16±0.07	3.20±0.10 <sup>c</sup>	3.22±0.09	3.10±0.03	3.22±0.10
non-coated	3.21±0.05	3.04±0.06 <sup>b</sup>	3.17±0.05	3.15±0.07 <sup>c</sup>	3.06±0.07	3.15±0.06	3.19±0.04
LSD <sub>0.05</sub>	0.17	0.13	0.12	0.12	0.17	0.19	0.31
C.V. (%)	2.92	2.30	2.07	2.02	2.95	3.37	5.18

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.77** Vitamin C content (mg/100 ml juice) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings coatings and Zivdar during storage at room temperature ( $27\pm 3^{\circ}\text{C}$ ) and  $56\pm 11\%$  relative humidity for 13 days

Treatments	Storage time (days)						
	0	1	2	3	4	5	6
Formulation A	22.01 $\pm$ 1.09	25.16 $\pm$ 1.09	21.38 $\pm$ 1.09	22.01 $\pm$ 1.09	20.63 $\pm$ 0.00	22.44 $\pm$ 1.11	19.14 $\pm$ 1.07
Formulation B	22.01 $\pm$ 1.09	22.01 $\pm$ 2.88	21.38 $\pm$ 1.09	21.38 $\pm$ 1.09	20.63 $\pm$ 0.00	20.51 $\pm$ 1.11	21.60 $\pm$ 1.07
Formulation C	22.01 $\pm$ 1.09	22.64 $\pm$ 0.00	20.75 $\pm$ 1.89	20.75 $\pm$ 1.89	21.25 $\pm$ 1.08	21.79 $\pm$ 1.11	19.75 $\pm$ 1.07
Formulation D	22.01 $\pm$ 1.09	23.27 $\pm$ 1.09	22.64 $\pm$ 1.89	20.75 $\pm$ 0.00	21.25 $\pm$ 2.87	21.15 $\pm$ 1.93	22.84 $\pm$ 1.07
Zivdar	22.01 $\pm$ 1.09	22.01 $\pm$ 1.09	23.27 $\pm$ 2.89	22.64 $\pm$ 0.00	20.00 $\pm$ 2.17	22.44 $\pm$ 2.94	21.60 $\pm$ 2.83
non-coated	22.01 $\pm$ 1.09	22.01 $\pm$ 2.88	22.01 $\pm$ 2.18	20.75 $\pm$ 1.89	20.00 $\pm$ 2.17	19.87 $\pm$ 1.11	20.37 $\pm$ 1.85
LSD <sub>0.05</sub>	1.94	3.26	3.45	2.24	3.14	3.02	2.90
C.V. (%)	4.96	8.03	8.86	5.88	8.57	7.94	7.81

Means followed by different superscript letters within a column are significantly different ( $P\leq 0.05$ )

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

**Table A.77 (continued)** Vitamin C content (mg/100 ml juice) of tangerine fruit cv. 'Sai Nam Phueng' coated with 4 developed coatings and Zivdar during storage at room temperature (27±3°C) and 56±11% relative humidity for 13 days

Treatments	Storage time (days)						
	7	8	9	10	11	12	13
Formulation A	21.85±2.17	21.25±1.08	19.25±1.08	23.27±1.09 <sup>a</sup>	20.50±1.87	21.25±1.08	21.52±1.09 <sup>bc</sup>
Formulation B	21.88±1.08	21.25±1.08	21.74±1.07	21.38±1.09 <sup>ab</sup>	20.50±0.00	21.25±1.08	25.31±1.10 <sup>a</sup>
Formulation C	21.25±2.17	21.25±1.08	19.87±2.15	20.75±1.89 <sup>bc</sup>	20.49±3.23	21.88±2.17	20.89±1.90 <sup>c</sup>
Formulation D	23.75±1.09	20.63±1.88	22.36±0.00	20.75±1.89 <sup>bc</sup>	21.12±1.07	20.00±1.09	24.05±1.10 <sup>ab</sup>
Zivdar	20.00±2.17	20.63±0.00	20.50±1.87	18.87±0.00 <sup>c</sup>	22.36±3.23	23.13±1.09	21.52±1.09 <sup>bc</sup>
non-coated	20.00±1.09	22.50±0.00	21.74±2.15	20.75±0.00 <sup>bc</sup>	23.60±2.15	23.13±2.17	21.52±2.19 <sup>bc</sup>
LSD <sub>0.05</sub>	3.04	1.92	2.82	2.24	3.98	2.72	2.63
C.V. (%)	7.98	5.09	7.57	6.00	10.45	7.03	6.59

Means followed by different superscript letters within a column are significantly different (P≤0.05)

4 developed coatings:

- Formulation A : 8% candelilla microemulsion + 12% commercial polyethylene
- Formulation B : 17.5% commercial polyethylene + 0.5% shellac in ethanol
- Formulation C : 17.5% commercial polyethylene + 0.5% shellac microemulsion
- Formulation D : 17.5% polyethylene microemulsion + 0.5% shellac microemulsion

## PUBLICATIONS

### National Presentations

**Seehanam, P.,** D. Boonyakiat and N. Rattanapanone. 2008. Effect of coating materials and storage temperatures on physicochemical compositions and sensory properties of tangerine fruits cv. Sai Nam Puang. Oral presentation in the 7<sup>th</sup> National Horticultural Congress. Amarin Lagoon Hotel, Phitsanulok, Thailand, May 26-30.

**Seehanam, P.,** D. Boonyakiat and N. Rattanapanone. 2008. Effects of Fruit Sizes and Coating Materials on Quality of Tangerine Fruit cv. Sai Nam Phueng. Oral presentation in the 8<sup>th</sup> National Horticultural Congress. The Empress Hotel and Convention Center, Chiang Mai, Thailand, May 6-9.

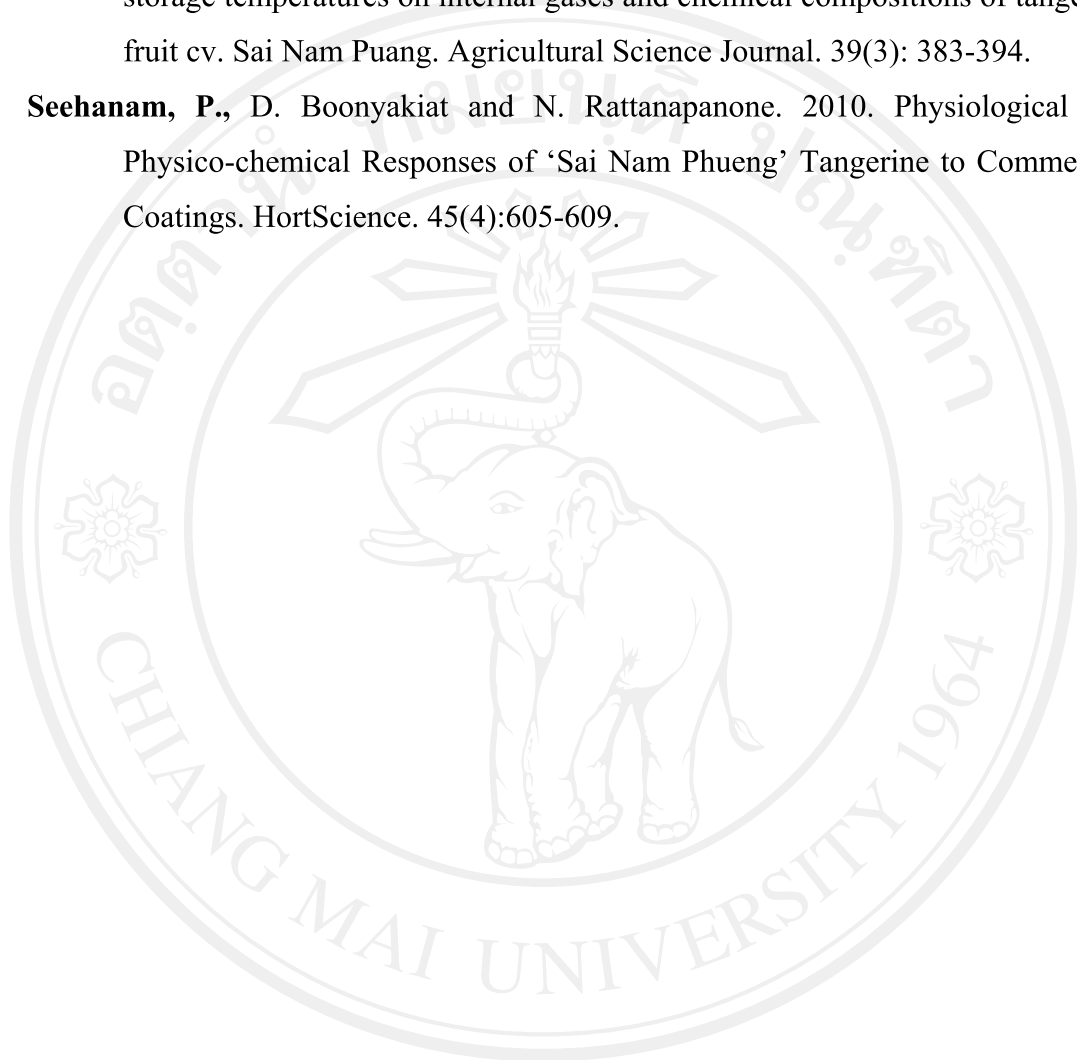
### International Presentations

**Seehanam, P.,** D. Boonyakiat and N. Rattanapanone. 2008. Quality of coated tangerine fruit cv. Sai Nam Puang during storage. Poster presentation in the 11<sup>th</sup> International Citrus Congress, Postharvest Biology and Technology Section, Wuhan Science and Technology Conference and Exhibition Center Wuhan, China, October 26-30.

Boonyakiat, D., **P. Seehanam** and N. Rattanapanone. 2008. Correlation of internal gasses, ethanol content and alcohol dehydrogenase activity during storage of tangerine fruit coated with commercial coatings. Poster presentation in the 11<sup>th</sup> International Citrus Congress, Postharvest Biology and Technology Section, Wuhan Science and Technology Conference and Exhibition Center Wuhan, China, October 26-30.

**Journal Publications**

- Seehanam, P.,** D. Boonyakiat and N. Rattanapanone. 2008. Effects of coatings and storage temperatures on internal gases and chemical compositions of tangerine fruit cv. Sai Nam Puang. *Agricultural Science Journal*. 39(3): 383-394.
- Seehanam, P.,** D. Boonyakiat and N. Rattanapanone. 2010. Physiological and Physico-chemical Responses of 'Sai Nam Phueng' Tangerine to Commercial Coatings. *HortScience*. 45(4):605-609.



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<b>Scholarships</b>	2006-2009	The Program Strategic Scholarships for Frontier Research Network for the Ph.D. Program Thai Doctoral Degree from the Office of the Higher Education Commission, Thailand (Grant No. 53/2006)