

LIST OF FIGURES

FIGURE	PAGE
REVIEW OF LITERATURE	
1 The tree of <i>C. nervosum</i> var. <i>paniala</i>	4
2 The flowers of <i>C. nervosum</i> var. <i>paniala</i>	4
3 The berries of <i>C. nervosum</i> var. <i>paniala</i>	5
4 Effect of excess free radical (Oxidative stress)	12
5 The mechanism of oxygen free radicals in cancer.....	14
6 Example of antioxidant compounds.....	16
METHODOLOGY	
7 Voucher herbarium specimens of <i>C. nervosum</i> var. <i>paniala</i>	23
FINDING AND RESULTS	
8 The macroscopic of ripe berries of <i>C. nervosum</i> var. <i>paniala</i>	54
9 The microscopic of ripe berries of <i>C. nervosum</i> var. <i>paniala</i>	56
10 The microscopic of dry berries of <i>C. nervosum</i> var. <i>paniala</i>	57
11 Preliminary phytochemical screening of <i>C. nervosum</i> var. <i>paniala</i>	60
12 TLC fingerprint and test for alkaloid of <i>C. nervosum</i> var. <i>paniala</i>	62
13 TLC fingerprint and test for anthraquinone and coumarin of <i>C. nervosum</i> var. <i>paniala</i>	62
14 TLC fingerprint and test for antioxidant of <i>C. nervosum</i> var. <i>paniala</i>	62
15 TLC fingerprint and test for flavonoid of <i>C. nervosum</i> var. <i>paniala</i>	63
16 TLC fingerprint and test for phenolic compound and tannin of <i>C. nervosum</i> var. <i>paniala</i>	63
17 TLC fingerprint and test for saponin of <i>C. nervosum</i> var. <i>paniala</i>	63
18 HPLC chromatogram (fingerprint, 254 nm) of <i>C. nervosum</i> var. <i>paniala</i> extracted with 95% ethanol.....	64
19 HPLC chromatogram (fingerprint, 365 nm) of <i>C. nervosum</i> var. <i>paniala</i> extracted with 95% ethanol.....	65
20 HPLC chromatogram (fingerprint, 510 nm) of <i>C. nervosum</i> var. <i>paniala</i> extracted with 95% ethanol.....	66

LIST OF FIGURES (continued)

FIGURE	PAGE
21 UV-Vis spectrum (200-800 nm) of <i>C. nervosum</i> var. <i>paniala</i>67 powder extracted with 95% ethanol	67
22 UV-Vis spectrum (200-800 nm) of <i>C. nervosum</i> var. <i>paniala</i> powder68 extracted with 95% ethanol	68
23 The characteristic of crude extracts of <i>C. nervosum</i> var. <i>paniala</i> from.....72 different extraction methods	72
24 UV-Vis spectrum (200-800 nm) of crude extracts of <i>C. nervosum</i>73 var. <i>paniala</i> from different extraction methods	73
25 UV-Vis spectrum (380-650 nm) of crude extracts of <i>C. nervosum</i>74 var. <i>paniala</i> from different extraction methods	74
26 Total monomeric anthocyanin content in crude extracts of <i>C</i>76 <i>nervosum</i> var. <i>paniala</i> from different extraction methods	76
27 Pigment degradation, polymeric color and browning content in crude.....78 extracts of <i>C. nervosum</i> var. <i>paniala</i> from different extraction methods	78
28 Total phenolic compounds content in crude extracts of <i>C. nervosum</i>80 var. <i>paniala</i> from different extraction methods	80
29 Ascorbic acid, catechin, cyanidin 3-glucoside, gallic acid, kaempferol.....84 and quercetin content in crude extracts of <i>C. nervosum</i> var. <i>paniala</i> from different extraction methods	84
30 HPLC fingerprint of standards and extracts of the ripe berries of <i>C</i>85 <i>nervosum</i> var. <i>paniala</i> with visible detection at 245 nm for ascorbic acid	85
31 HPLC fingerprint of standards and extracts of the ripe berries of <i>C</i>86 <i>nervosum</i> var. <i>paniala</i> with visible detection at 280 nm for catechin	86
32 HPLC fingerprint of standards and extracts of the ripe berries of <i>C</i>87 <i>nervosum</i> var. <i>paniala</i> with detection at 510 nm for cyanidin 3-glucoside	87
33 HPLC fingerprint of standards and extracts of the ripe berries of <i>C</i>88 <i>nervosum</i> var. <i>paniala</i> with visible detection at 280 nm for gallic acid	88
34 HPLC fingerprint of standards and extracts of the ripe berries of <i>C</i>89 <i>nervosum</i> var. <i>paniala</i> with visible detection at 360 nm for kaempferol	89

LIST OF FIGURES (continued)

FIGURE	PAGE
35 HPLC fingerprint of standards and extracts of the ripe berries of <i>C. nervosum</i> var. <i>paniala</i> with UV detection at 365 nm for quercetin	90
36 Antioxidant activity (reduction of DPPH radical assay) of the reference standards and crude extracts of <i>C. nervosum</i> var. <i>paniala</i> from different extraction methods	93
37 Antioxidant activity (inhibition of lipid peroxidation in liposome assay) of the crude extracts of <i>C. nervosum</i> var. <i>paniala</i> from different extraction methods	95
38 HPLC chromatogram of cyanidin 3-glucoside standard and purified compound from the ripe berries of <i>C. nervosum</i> var. <i>paniala</i> with HPLC test condition 1	104
39 HPLC chromatogram of cyanidin 3-glucoside standard and purified compound from the ripe berries of <i>C. nervosum</i> var. <i>paniala</i> with HPLC test condition 2	105
40 HPLC chromatogram of cyanidin 3-glucoside standard and purified compound from the ripe berries of <i>C. nervosum</i> var. <i>paniala</i> with HPLC test condition 3	106
41 UV-Vis spectra of cyanidin 3-glucoside standard and purified compound from the ripe berries of <i>C. nervosum</i> var. <i>paniala</i> , detection at 200-800 nm	107
42 NMR spectrum of purified compound from the ripe berries of <i>C. nervosum</i> var. <i>paniala</i>	108
43 MS spectrum of purified compound from the ripe berries of <i>C. nervosum</i> var. <i>paniala</i>	109
44 The characteristic of the extracts in accelerate condition	111
45 The stability of the antioxidant activity (DPPH method) of the extracts in accelerate condition	114
46 The stability of the phenolics compound of the extracts in accelerate condition	114

LIST OF FIGURES (continued)

FIGURE	PAGE
47 The stability of pH of the extracts in accelerate condition.....	115
48 The stability of color of the extracts in accelerate condition.....	115
49 The stability of cyanidin 3-glucoside and quercetin content in the..... extracts with accelerate condition	116
50 The stability of moisture content in the extracts with accelerate..... condition	116
51 The characteristic of the extracts in ambient temperature condition.....	118
52 The stability of the antioxidant activity (DPPH method) of the extracts..... in ambient temperature condition	121
53 The stability of phenolics compound of the extracts in ambient..... temperature condition	121
54 The stability of pH of the extracts in ambient temperature condition.....	122
55 The stability of the color of the extracts in ambient temperature..... condition	122
56 The stability of cyanidin 3-glucoside and quercetin content in the..... extracts with ambient temperature condition	123
57 The stability of moisture content in the extracts with ambient..... temperature condition	123