CHAPTER V

CONCLUSIONS

The results of this study were concluded as follow:

The aril oil extract of *Momordica cochinchinensis* (Lour.) Spreng was extracted by screw press machine. Yield of oil was 15%w/w of the wet aril. Oil produced by this process contained about 2,300 ppm of total carotenoids and 400 μg/g of β-carotene.

This study tested antioxidation activity of aril oil by two methods that were DPPH and FRAP methods. Both methods gave similar results that of antioxidation activity that (±)-α-tocopherol was higher than aril oil.

Nanostructured lipid carriers of aril oil of *Momordica cochinchinensis* (Lour.) Spreng were prepared by the modified high pressure homogenization. Major compounds in this plant were carotenoids which was. This technique was applied for the stability enhancement of these compounds. Aril oil-loaded NLC had average size in range of 130 ± 0.7nm, polydispersity index of 0.24 ± 0.047 and zeta potential value of -39.1 ± 0.34. The morphology of particle size was observed by TEM and found to be the round shape.

Reversed-phase high performance liquid chromatography procedure was developed and validated for analysis of β-carotene The working calibration curves over the ranges of 5.0-100.0 μg/mL was successfully applied for the preparation of aril oil-loaded NLC and cream containing aril oil-loaded NLC were studied. After 8 hours of expose to light from a fluorescent bulb (approximately 600 lux) in the black box at room temperature. Cream containing aril oil and cream containing aril oil-loaded NLC had remaining percentages of β-carotene 42.14 and 59.52%, respectively. Subsequently, stability over time of cream containing aril oil and cream containing aril oil-loaded NLC at controlled temperature for 3 months was examined. At 45 °C, the percentage remaining of β-carotene was 27.79 and 37.83%, respectively. At 25 °C, the percentage remaining of β-carotene was 59.84 and 73.38%, respectively. The highest content of β-carotene at 4°C was 73.98 and 79.87%, respectively. The preparation of aril oil-loaded NLC and cream containing aril oil-loaded NLC was simple, convenient, rapid, economical low cost, and safe. The proposed method was successfully applied for

preparation of aril oil of *Momordica cochinchinensis* in the form of NLC. The NLC exhibited greater β-carotene stability upon exposure to light and temperature.

The physical characteristics of cream base, cream containing aril oil, cream containing NLC and cream containing aril oil-loaded NLC after stored at various temperatures (heating-cooling cycling, 4, 25 and 45°C for 90 days) were good. Viscosity and pH of all prepared creams had a small change. The resulted physical properties showed that all formulations had good stability.

According to the stability studies of β-carotene of aril oil at various temperatures for 90 days by RP-HPLC method, the remaining percentage of β-carotene concentration of cream containing aril oil and cream containing aril oil-loaded NLC were reduced in the same way; at 4°C gave the highest concentration and at 45°C gave the lowest concentration. The remaining of β-carotene concentration of cream containing aril oil-loaded NLC at 90 days was higher than cream containing aril oil in all stored temperatures.

The results of skin irritation tests indicated that there were no irritation in normal volunteers for cream base, cream containing aril oil and cream containing NLC and cream containing aril oil-loaded NLC. The wrinkle reducing capacity test indicated that the cream containing aril oil and cream containing aril oil-loaded NLC presented significantly reducing of wrinkle. But, the cream containing aril oil-loaded NLC exhibited significantly the capability to reduce skin wrinkle higher than cream containing aril oil.