CHAPTER 6
CONCLUSION

This study has investigated an antioxidant activity of active fractions and compounds of *B. monosperma* flowers extract. Three antioxidant testing methods including ABTS, FRAP, and DPPH methods were employed for the activity-guide fractionation. The highest antioxidant activity was obtained from the fraction isolated from the dried flowers powder macerated with 80 % ethanol which was further fractionated with opened column chromatography (the F2 fraction from the ethanolic crude extract). Active components in this fraction were selected to be the active markers. From chromatographic and spectroscopic data, 4 bioactive principles were 2 flavonoids: butin (m/z = 274.1 $[M+2H]^+$) and butein (m/z = 273.2 $[M+H]^+$) and 2 flavonoid glycosides: isomonospermoside (m/z = 436.2 $[M+2H]^+$) and monospermoside (m/z = 435.2 $[M+H]^+$)

In order to deliver the *B. monosperma* flowers extract, appropriate nanoparticle systems were evaluated. Nanostructured lipid carrier (NLC) and polylactide-co- glycolide (PLGA) nanoparticle systems yielded nano-size particulates with appropriate narrow size distribution and surfaced charge characters. However, the NLC is better than PLGA nanoparticles for delivery the extract because there are many advantages for cosmetic application such as non-toxic ingredients, no organic solvent requirement and possible large scale production.

The formulation of selected NLC was consisted of the palmitic acid and stearyl alcohol as the solid lipid and jojoba oil as the liquid lipid. The optimal ratio of solid lipid to liquid lipid was 7 : 3 which was the most suitable ratio for NLC production. The calculated required HLB of the lipid mixture was 12.3 which was suitable for production of NLC by emulsification technique. This number indicated a suitable emulsifier used for preparation of emulsion. The extract with both polar and non-polar moieties could entrapped into the nanoparticular system. The NLC formulation yielding the particles size of 88.6 to 110.1 nm, polydispersity index (PDI)

of 0.354 to 0.506, zeta potential of -34.8 to -40.2 mV and percentage of flavonoid entrapment efficiency of 23.82 – 30.01 %.