CHAPTER V

CONCLUSIONS

Six kinds of Northern Thai medicinal plants, *Caesalpinia sappan* L., *Leea rubra* Blume ex Spreng., *Syzygium albiflorum* Bahodur & R.C. Guar ST., *Vernomia volkameriforia* Wall.ex DC., *Schleichera oleosa* Merr. and *Holoptelea integrifolia* Planch. were extracted with ethanol by soxhlet's apparatus to give the ethanolic extracts. The extracts were studied for free radical scavenging activity by $ABTS^{\bullet+}$ decolorizing assay, superoxide anion, nitric oxide and peroxynitrite scavenging activity and protection DNA damage-induced by Fenton reaction. $ABTS^{\bullet+}$ scavenging activity of test samples followed the following order: *L. rubra* > *C. sappan* > *S. albiflorum* > *S. oleosa* > *V. volkameriforia* > *H. integrifolia*. *L. rubra* exhibited the highest $ABTS^{\bullet+}$ scavenging activity with the Vitamin C Equivalent Antioxidant Capacity (VCEAC) = 0.6107 ± 0.14 g L-ascorbic acid/g of extract and Trolox Equivalent Antioxidant Capacity (TEAC) = 0.9485 ± 0.0052 g trolox/g of extract. Superoxide anion scavenging activity of test samples followed the following order: *C. sappan* > *S. albiflorum* > *L. rubra* > *V. volkameriforia* > *S. oleosa* > *H. integrifolia*. *C. sappan* showed the highest superoxide anion scavenging activity with an EC_{50} value of 7.73 ± 0.06 µg/ml, which is comparable to the activity of L-ascorbic acid with EC_{50} = 6.65 ± 0.07 µg/ml and rutin with EC_{50} value of 7.83 ± 0.13 µg/ml. Furthermore, it exhibited the highest nitric oxide scavenging activity with EC_{50} value of 4.24 ± 0.14 µg/ml. The activity was comparable to curcumin with an EC_{50} value of 5.70 ± 0.08 µg/ml. The order of nitric oxide scavenging activity of test samples was *C. sappan* > *S. albiflorum* > *L. rubra* > *V. volkameriforia* > *S. oleosa* > *H. integrifolia*. Peroxynitrite scavenging activity of test samples followed the following order: *C. sappan* > *S. albiflorum* > *S. oleosa* > *L. rubra* > *V. volkameriforia* > *H. integrifolia*. *C. sappan* showed the highest peroxynitrite scavenging activity with the EC_{50} value of 178.3 ± 2.79 µg/ml, which comparable to EGCG

with an EC_{50} value of 202.7 ± 2.17 µg/ml. All of medicinal plant extracts showed a concentration- dependent antiradical activity. *C. sappan* exhibited the highest efficient protection superocoiled DNA PUC18 damage from Fenton reaction at 5 µg/ml. The dilution with *L. rubra*, *S. albiflorum* and *S. oleosa* that efficient protection supercoiled DNA PUC18 damaged from Fenton reaction can be observed for a concentration of 25, 25 and 50 µg/ml, respectively. *V. volkameriforia* and *H. integrifolia* can not protection supercoiled DNA PUC18 damaged from Fenton reaction at the maximum concentration of 50 µg/ml.

The order of the phenolic compounds content of the test samples was *C. Sappan* > *L. rubra* > *S. albiflorum* > *S. oleosa* > *V. volkameriforia* > *H. integrifolia*, which was broadly similar to their $ABTS^{\bullet+}$ scavenging activity, superoxide anion scavenging activity, nitric oxide scavenging activity, peroxynitrite scavenging activity, and DNA damage protection-induced by Fenton reaction. It is extremely important to point out that there is a positive correlation between antioxidant activity and amount of phenolic compounds of the extracts. Thus, *C. sappan* contains high levels of total phenolic compounds, which may account for its impressive antioxidant activity.

Three extracts, *C. sappan*, *L. rubra* and *S. albiflorum*, with high antiradical activity were chosen to study cyclooxygenase-2 inhibition. All extracts can not inhibited cyclooxyganase-2 enzyme via the measurement of prostaglandin produced from mouse COX-2 null cell line, which comparable to aspirin. Taken together, these findings suggest that the anti-radicals activity is not relate to anti-inflammatory property via the measurement of prostaglandin produced from mouse COX-2 null cell line. The anti-inflammatory property of the Northern Thai medicinal plant extracts may be active in another pathway of inflammation, because of the inflammation process has the several pathways. In the future, the extracts will be studied for the anti-inflammatory property on the other pathways.