CHAPTER V

CONCLUSIONS

Transformant yeast cell-based assay is a powerful and useful tool for screening out compounds with topoisomerase I-targeted agents from Thai medicinal plants with previously reported as cytotoxicity. This method is highly specific, easily and cost-effective.

From the screening of twenty-seven Thai medicinal plants, six ethanolic extracts; root and leaf of *Rhinacanthus nasutus*, whole plant of *Grangea maderaspatana*, caudex of *Stephania suberosa*, rhizome of *Curcuma longa* and rhizome of *Curcuma zedoaria,* showed inhibitory activities of enzyme topoisomerase I. These results support previous reports on the efficacy of Thai medicinal plants used as traditional medicine for anti-cancer. The extract of *G. maderaspatana* was selected for further study to determine the bioactive compounds since it has never been reported for its topoisomerase I inhibitory activity before.

In this study, bioassay-guided fractionation was performed to get main active compounds from whole plant of *G. maderaspatana*. Two bioactive compounds are sesquiterpene lactone namely, (-)-frullanolide and (-)-7α-hydroxyfrullanolide. Their structures were determined by spectroscopic methods and compared with previous publications.

In vitro cytotoxicity activities of (-)-frullanolide and (-)-7α-hydroxyfrullanolide showed potential anti-cancer agents from *G. maderaspatana*. The two compounds exhibited cytotoxicity activities against KB oral cavity cancer cell lines with IC_{50} = 6.38 and 5.48 µM, MCF-7 breast cancer cell lines with IC_{50} = 29.7 and 3.35 µM, and NCI-H187 small lung cancer cell lines with IC_{50} = 3.23 and 5.77 µM, respectively. However, both compounds showed cytotoxicity activities against vero cell lines with IC_{50} = 10.3 and 3.41 µM respectively.

These results supported that bioassay-guided fractionation method is a powerful for isolated and elucidated bioactive compounds from natural products. *G. maderaspatana*

have potent anti-cancer agents, which function by inhibitory of topisomerase I enzyme activity. Interestingly, topoisomerase I inhibitory activity of the isolated compounds, (-)-frullanolide and (-)-7α-hydroxyfrullanolide, in our finding is novel.

In further study, bioassay-guided phytochemical analysis should be performed to get main active compounds from other plants that showed topoisomerase I inhibitory activities.