

CHAPTER VI

CONCLUSIONS

6.1 CONCLUSIONS

Manganese superoxide dismutase (MnSOD) called ST-1 was purified from *S. tuberosa* could be used as a new potential drug. Many studies have shown that SOD acts as an antioxidant and anti-inflammatory and also has a potent in anti-aging treatment. Nowadays, SODs are applied to use for treating many diseases such as osteoarthritis, rheumatoid arthritis, gout and *etc* by injection. A sterile solution contained SOD can be directly applied to eyes for treating ulcers on the cornea. In addition, SODs are also available by sublingual oral supplements and topical creams so there are SOD commercial products such as SOD supplement or SOD skin cream/lotion. Moreover, SOD detection method was developed. The developed method using non-denaturing 2D-GE coupled with SOD activity was efficient and reliable for SOD detection and isoform separation compared to the original method. The method is likely applicable to identify type of SOD staining and could be used for detect SOD from plants or other organisms and a similar approach could be developed for detection of other important enzymes in the future.

Cyclotides are defense cyclic-peptide from plant that has a head to tail cyclized backbone with three disulfide bonds. Therefore, cyclotides are stable to thermal, chemical and enzymatic degradation which makes them useful as a peptide framework for drug design application. In addition, cyclotides also have various biological activities such as uterotonic, insecticidal, anti-HIV, anti-microbial and anti-

cancer properties which can be applied to use in pharmaceutical and agricultural applications. Although cyclotides are now developed for using as a commercial product but it is worth to study because cyclotides can fill the current pharmaceutical gap since they are stable, orally bioavailable, amenable of grafting, synthesis accessible and more specific target.

6.2 RESEARCH LIMITATION

The limitations of this study occurred in chapter III and V. In chapter III, it is about the limited data in the plant protein sequence databases prevented matches of the tryptic peptides from spot 4. Another research limitation showed in chapter V is about the limited amount of plant sample from *V. sumatrana*. This is probably a main reason for only known cyclotides, which are a major cyclotides in nature, being found.

6.3 SUGGESTION FOR FUTURE WORK

The purified SOD from *S. tuberosa* suits for continued study on biological activities such as anti-inflammatory or anti-aging activity for future applications. Furthermore, *V. sumatrana* plant sample needs to collect more material for discover more cyclotides which is useful for further study on cyclotide evolution in plant and also could be applied to use as a drug design in the future although we found two new cyclotides from this plant