
CHAPTER 6

CONCLUSION

Ganoderma lucidum has drawn folk's attention in improving health status in which it could ameliorate ailments and lessen diseases risk. In this study, *G. lucidum* mycelia were cultivated by submerged fermentation and the mycelia biomass obtained after 7 days of cultivation was $4.969 \text{ g/L} \pm 0.874 \text{ g/L}$. With regard to the presented results, it appeared that mycelia crude water extract inhibited ACE activity stronger than broth crude water extract. The IC_{50} value of mycelia crude water extract was determined at 0.90 mg/mL (protein content of 1.134 mg/mL).

Following protein fractionation of the mycelia crude water extract, protein fractions A and C showed approximately 9-fold and over 10-fold ACE inhibitory strength higher than the crude water extract. Both fractions were further purified by RP-HPLC and all the eluted peaks collected were assayed for their ACE inhibitory potential. Above all, HPLC peaks C3, C4 and C5 seemed to be the potential ACE inhibitors, having IC_{50} values of 10.0, 18.0 and $12.5 \text{ } \mu\text{g/mL}$ respectively. Identification of the SDS-PAGE protein bands for these HPLC peaks revealed the presence of promising antihypertensive related proteins which are:

- i. **Cystathionine beta synthase-like protein**, with partial protein sequences of RISGLIYEDVR and ILRDNIQGITKPAIR
- ii. **DEAD/DEAH box helicase-like protein**, with partial protein sequences of IIKANDHASVQISIAK and MENEKGEIVDLYVPR
- iii. **Paxillin-like protein**, with partial protein sequences of IHRLLR and IIPRHLQLAIR, and
- iv. **Alpha beta hydrolase-like protein**, with partial protein sequences of GIPNQQILGK, NIGEPLGGPKK and IDVSVGKAIQK

Since the antihypertensive related proteins were derived from food source, it is suggested that they provide less possibility to exert adverse side effects and could be developed as an alternative to conventional antihypertensive drug treatment. The ACE inhibitory activity of the mycelia itself makes it potentially attractive to be commercialized as functional food in the future.

This work had emphasized on *in vitro* ACE inhibitory activity, HPLC purification and identification by proteomic platform of the potential antihypertensive related proteins isolated from mycelia crude water extract. Future works that are proposed here include further isolation for pure ACE inhibitor, elucidation of the relationship between ACE inhibitor's structure and activity as well as *in vivo* study using animals to assure its application as a safe alternative antihypertensive treatment for human.

