

CHAPTER 6

CONCLUSION

In this research, *Termitomyces heimii* mushroom was successfully isolated and identified from Negeri Sembilan during the monsoon. The collected mushroom's mycelium was successfully grown by tissue culture technique and it was concluded that the combination of PDA + ME + YE gave a thick full plate growth of mycelium in 14 days of cultivation. Extracts of THR2 were prepared from both fruiting body and mycelial biomass using water as the solvent. The THR2 mycelium was able to grow and produce polysaccharide in submerged liquid fermentation (SLF) with a biomass of 8.55 g/L, 0.80 g/L of IPS and 1.44 g/L of EPS respectively. ENS of THR2 fruiting bodies were successfully obtained from both hot and cold water extraction process which is 3.20 g/L (HW-ENS) and 1.36 g/L (CW-ENS). By using the FTIR spectra analysis the polysaccharides obtained from the SLF was verified as β -glucan and it exhibits antimicrobial properties with highest response observed in the HW-ENS from fruiting bodies compared to the β -glucan extracted from the mycelium. However, the extracts did not show any antifungal properties. Phytochemicals such as flavonoids, saponins and terpenoids were detected in all the THR2 extracts and the total flavonoid content (TFC) was in the range of 2.16 – 2.86 mg/g. However, HWE-ENS showed higher concentration of flavonoid and ascorbic acid content with the lowest IC_{50} value which is 4.44 mg/ml whereas EPS showed the highest IC_{50} value which is 6.71 mg/ml. Out of this four THR2 extracts HW-ENS can be considered as extract with high potential of antioxidant activity as the IC_{50} value was the lowest with high percentage of inhibition at 10 mg/ml which was 90.83% compared to all the other extracts.

This study was the first study which has successfully cultivated *T. heimii* on both potato dextrose agar (PDA) and submerged liquid fermentation (SLF). However, for future studies the optimization of medium components as well as the physical fermentation factors (pH, temperature, speed of rotation) is needed to produce high biomass of *T. heimii* mycelium and β -glucan polysaccharides. Not only that, the extracted β -glucan can be further tested for anticancer analysis.