CHAPTER V

CONCLUSIONS

UV-B induced oxidative stress of retinal pigment epithelial cells plays an important role in the development of age-related macular degeneration (AMD). Although, lutein has been shown to protect cultured reatinal cells from various oxidative insults, there was no direct evident showing its protective effect on UV-B irradiation. Besides marigold flower, yellow silk cocoon is an interesting source of lutein. The aim of this study was to investigate the effect of lutein extracted from silk yellow cocoon, on UV-B induced retinal epithelial cells damage. ARPE-19 cells line was used in this study. The results showed that UV-B irradiation decreased cell viability in dose dependent pattern. UV-B increased production of intracellular reactive oxygen species (ROS) and lipid peroxidation in ARPE-19 cells. UV-B also affected activities of several antioxidant enzymes. Activities of catalase and superoxide dismutase were decreased while that of glutathione peroxidase was increased. It should be noted that catalase activity was differently affect by UV-B depending on time after exposure. In addition, the results showed that UV-B increased the caspase 3 activity in ARPE-19 cells suggesting apoptotic cell death. According to lutein treatment, this study demonstrated the protective effect of silk lutein extract on UV-B induced oxidative stress in ARPE-19 cells. This protective effect of lutein depending on its concentration and treatment period. At 24 h pretreatment, silk lutein extract at 10 μM did not prevent ARPE-19 cell death, and slightly protection was observed 50 μM concentration. For lutein treatment periods, short time period provided more protective effect than longer period treatment. Pretreatment cells with 50 μM silk lutein extract for 4 h could significantly protect cells against UV-B irradiation. Silk lutein extract, standard lutein (marigold flower) and vitamin E at the same concentration similarly exhibited protective effects. Combination of each lutein and vitamin E (25 μM) showed the protective effect in the same degree as individual compound at 50 μM. The enhancing effect might be because trolox prevented degradation of lutein(s). Taken all data together, silk lutein extract could prevent

retinal pigment epithelial cells damage mediated by UV-B irradiation and its combination with vitamin E could be useful for development of lutein products as dietary supplement for AMD prevention.