CHAPTER V
CONCLUSIONS

In the present study, a novel wound dressing prepared from bacterial cellulose pellicle containing sericin was successfully developed. The bacterial cellulose was synthesized by *Acetobacter xylinum* in the form of ultrafine nanofibril network structure. Bacterial cellulose pellicle was used as wound dressing matrix and sericin was used as active ingredient agent. According to FT-IR spectra, Kjeldahl method and SEM images, indicated that sericin were successfully incorporated into bacterial cellulose pellicle. FT-IR spectra of bacterial cellulose containing sericin exhibited the peak of both bacterial cellulose and sericin. Kjeldahl analysis also suggested the presence of an increasing amount of sericin in bacterial cellulose when higher sericin concentrations were used. SEM images illustrated the sericin solution filled the porous structure and homogeneously distribute in bacterial cellulose matrix. The incorporation of sericin in bacterial cellulose pellicle could be enhancing antioxidant activity to prevent cell and tissue from oxidative damage of reactive oxygen species such as hydroxyl and peroxyl radicals. The water absorption capacity and water vapor transmission rate exhibited that bacterial cellulose containing sericin has potential to absorb wound exudates and also maintain moist environment at wound area. The amount of released sericin was crucial in terms of enhancing antioxidant capacity and wound healing process. On the other hand, sericin remaining in bacterial cellulose was beneficial because sericin can provide moisture and promote collagen production in wound area. Moreover, the cytotoxicity results showed that the pure bacterial cellulose and the as-prepared bacterial cellulose containing sericin samples were non-cytotoxic to human dermal fibroblast cell lines. Therefore, the bacterial cellulose containing sericin is a good candidate of wound dressing materials due to the synergic benefit of the both materials.