

CHAPTER VI

CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

Lactic acid bacteria with inhibitory activity against spoilage yeast *R. mucilaginosa* were isolated from various sources. Spoilage yeast identified as *R. mucilaginosa* were isolated from cucumber and carrot. Three isolates from LAB identified as *L. casei* YG1, *L. casei* DF22, and *L. plantarum* C16 were studied for the inhibitory activity using dual agar plate method. Effect of pH, heat and enzyme treatment significantly affected the inhibitory activity of cell free supernatant of *L. casei* YG1, *L. casei* DF22, and *L. plantarum* C16 showed that inhibitory activity were due to the presence of several antimicrobial compound such as proteinaceous compound, bacteriocin, and organic compound.

Additionally, all three LABs have the ability to inhibit each other indicating the presence of bacteriocin. CFS of *L. casei* YG1, *L. casei* DF22, and *L. plantarum* C16 showed high anti-adhesion activity against biofilm produced by *R. mucilaginosa* CBR using pre-coating and co-incubation method. Adjustment of pH to pH 3, 5, 6, and 7 affected the anti-adhesion activity of CFS *L. casei* YG1, *L. casei* DF22, and *L. plantarum* C16. Heating the CFS to 90°C and 121°C reduced the anti-adhesion activity of *L. casei* YG1, *L. casei* DF22, and *L. plantarum* C16. Treating the CFS of *L. casei* YG1, *L. casei* DF22, and *L. plantarum* C16 with proteolytic enzyme resulted in significant loss of activity especially when treated by papain. Hence, LAB isolates

from various sources have proven to show inhibitory activity against spoilage yeast, *R. mucilaginosa* and it has the potential to be used as food bio-preservatives.

6.2 RECOMMENDATIONS

Further studies on the antimicrobial peptides of LAB-CFS are recommended using RP-HPLC, Sephadex, and Gel Chromatography. It is also recommended to use LC-QTOF-MS to identify the entire anti-microbial components present in the cell free supernatant of LAB. Additional studies on the production of bio-surfactant from LAB isolates are important for anti-adhesion activity against various types of biofilm produced by yeast and bacteria. For application purposes, CFS of LAB should be applied in food system to observe the ability in food preservation.