

## **Application of lactic acid bacteria to control microbial contaminants during fermentation of cocoa beans 1**

### **Abstract**

Cocoa is one of the leading commodity plantation sector. Not only has the potential to increase the country's foreign exchange income but also a major source of income for cocoa farmers in many centers of cocoa producer, but the quality of cocoa beans produced have not been uniform and not in accordance with international standard, resulting in low international price of cocoa market. One of the opportunities to improve the quality of cocoa is through development on fermentation and preservation technology of cocoa beans, using cultures of lactic acid bacteria (LAB) isolated from palm sap-based fermented products. Some LAB strains those had been isolated from palm sap fermented liquid, identified as *Leuconostoc mesenteroides*, *Leuconostoc pseudomesenteroides*, *Lactobacillus plantarum* and *L. fermentum*. Results of assay on their antimicrobial activities showed that only *L. fermentum* and *L. plantarum* were effective on inhibiting against the growth of some microbial contaminants in cocoa beans. Strain of *L. plantarum* was able to produce as much as 2.05% lactic acid and hydrogen peroxide as much as 24.87 杀g/ml, but did not produce bacteriocins. Strain of *L. plantarum* was also able to reduce the presence of microbial pathogens *S. Typhimurium* and *Aspergillus flavus* by 2 log units at concentrations of  $10^7$  -  $10^9$  CFU / ml, so that it can meet the quality standards of cocoa that has been established.