CHAPTER 4

CONCLUSIONS

4.1 Effect of microwave pretreatment on polyphenoloxidase (PPO), peroxidase (POD) and phenylalanine ammonia lyase (PAL) and preliminary quality of dried-longan pulp.

Fresh-longan pulp was inactivated by microwave pretreatment at 450 W and 900 W for treatment times of 40, 60 and 90s. The microwave-pretreated samples were dehydrated in hot air dryer at 70°C for 3 h and reduced to 55°C for 3-4 h. Dried-longan pulp was determined for the enzyme activities (PPO, POD and PAL) and the preliminary physical, nutritional and chemical qualities. The application of microwave pretreatment at 450 W; for 40, 60 and 90s, could inactivate PPO 10%, 30% and 42%, POD 0%, 25% and 43% and PAL 0%, 12% and 66%, respectively. While the power levels at 900 W; for 40, 60 and 90s, could inactivate PPO 8%, 50% and 52%, POD 0%, 36% and 46% and PAL 0%, 62% and 70%, respectively. The condition at 900 W for 90s of dried-longan pulp had the highest percentage of PPO, POD and PAL. The color (L^* a^* and b^* values) of dried-longan pulp at 450 W for 90s produced the greatest $L^*a^*b^*$ values. The microwave pretreatment was effective in preserving the loss of titratable acidity (7.8-42.0%), total soluble solid (4.2-12.5%) and increasing the firmness (22.3-43.6%) of dried-longan pulp when

compared with non-treated sample. Besides, the microwave pretreatments have impact on the nutritional value of dried-longan pulp. An increase in carbohydrate content (from 67.84% of control to 69.33% of microwave-pretreated products), ascorbic acid content (from 379 mg/100g of dry weight in control to 477 mg/100g of dry weight in microwave- pretreated products) and antioxidant index (from 1.34 in control to 2.44 in microwave pretreated dried sample). Otherwise, the microwave pretreatment also resulted in a decrease in moisture content and total phenolic content of dried-longan pulp.

4.2 Effect of microwave pretreatment on PPO, POD and PAL activities and the quality changes of dried-longan pulp during storage

Dried-longan pulp pretreated with microwave heating was stored in aluminum foil bags kept at room temperature and 4°C for 4 months. The PPO, POD and PAL activities and quality of dried longan pulp was investigated. It was found that the PPO and POD activities decreased to averages of 42% and 25% at the room temperature and 21% and 17% at 4°C, respectively, during storage at both temperatures. Though, the PAL activity increased markedly after 2 months of storage at these temperatures. Changes in brown color of microwave-pretreated samples occurred slower than the non-treated sample at the end of 4 months of storage especially the condition at 450 W for 90s which had turned to brown color less than other conditions with the *L** value of 36.19, *a** value 7.37 and *b** value 12.15. The total phenolic content, firmness and titratable acidity of those samples continuously decreased to 179.81 ug/g of dry weight, 18.17 N and 0.211 % citric acid, respectively. Whereas the moisture content and total soluble-solid content increased to 13.3 %wb and 9.5°Brix, respectively.

4.3 Effect of different packaging material on PPO, POD and PAL activities and the quality changes of dried-longan pulp during storage

The optimum condition of microwave pretreatment at 450 W for treatment times of 90s was chosen. The microwave-pretreated and non-treated samples were dehydrated in hot air oven at 70°C for 3 hours and reduced to 55°C for 4-5 hours. The microwave-pretreated and non-treated of dried-longan pulp were packed into LLDPE, OPP and aluminum foil bags and then stored at room temperature and 4°C. The results indicated that the aluminum foil bag could preserve the pale brown color of dried-longan pulp better than the LLDPE and OPP bags. Changes in PPO, POD and PAL of dried-longan pulp packed in foil bag were less than packed in OPP and LLDPE bags, which may be due to the aluminum foil bag. It could effectively prevent the oxygen penetration which could promote the enzyme catalysis.