CONCLUSION AND RECOMMENDATION

This study is aimed at controlling *P. waterhousei* by using modified atmospheres. This procedure is regarded as totally residue free and environmentally safe. Four modified atmosphere conditions: 100% CO_2 (G1), 80% CO_2: 20%N_2 (G2), 60% CO_2: 40%N_2 (G3), and 100%N_2 (G4) were applied to control this insect.

Results from this study indicate that the probit regression equation satisfactorily represented the observed mortality of *P. waterhousei* eggs, larvae, pupae, and adults. Thus, the equations were dependable for predicting the LT_{50} and LT_{99}.

The relative toxicity of modified atmospheres to *P. waterhousei* eggs, larvae, pupae, and adults was determined by comparing the LT_{50} values from probit analysis. The descending order of relative toxicity of modified atmospheres to *P. waterhousei* eggs was G2>G1>G4>G3. The declining order of relative toxicity of modified atmospheres to *P. waterhousei* larvae, pupae, and adults was G1>G2>G4>G3. Thus the relative toxicity of modified atmospheres to *P. waterhousei* was related to the developmental stages. The relative susceptibility of *P. waterhousei* to G1 and G4, in decreasing order, was adults>eggs>larvae>pupae. The susceptibility of *P. waterhousei* to G3, in declining order, was adults~eggs>larvae>pupae. On the other hand, when four stages of *P. waterhousei* were exposed to G2, eggs were most sensitive followed by adults, larvae, and pupae.

In the field, the maximal control of *P. waterhousei* can be achieved by exposing infested Ling-Zhi mushroom in the G2 (80% CO_2: 20%N_2) for 3 days. In addition, the highest level of disinfestation can be accomplished by using 100%CO_2 with longer exposure time, 4 days. Moreover, cost and benefit of selected methods for controlling storage insect pests should be considered. Although the effectiveness of both G1 and G2 was comparable, the G1 (100% CO_2) is recommended for controlling this insect because this method required only one gas. Thus it is easier to apply and its application takes lower cost because it is not necessary to use gas mixing

apparatus. Besides, this method leaves no toxic residue, thus it is safe for consumers and environmentally friendly.