A PILOT STUDY TO APPLY CATTS AGAINST THE PEACH FRUIT MOTH, *Carposina sasakii*, IN APPLES

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A phytosanitation technology called CATTS (controlled atmosphere/temperature treatment system) has been developed to control some major lepidopteran species infesting apples. This study was intended to apply CATTS against the peach fruit moth, *Carposina sasakii*, in apples. *C. sasakii* underwent larval feeding period with five instars (L1-L5): 4.22 ± 0.89 days (L1), 3.28 ± 0.72 days (L2), 3.32 ± 0.74 days (L3), 3.77 ± 0.73 (L4), and 7.00 ± 2.83 days (L5) at 27℃. When each instar larvae were exposed to 44℃ for 30 min, the final L5 instar showed the most resistance. The median lethal time at 44℃ of L5 larvae was 10.36 min. A mixture treatment of the heat temperature with CO_2 much decreased survival of the L5 larvae. A CATTS condition was tested with heat treatment at 46℃ (fruit core: 44℃), 15% CO_2 + 1% O_2, and 16℃/h heat rate. When this CATTS treatment was applied to apples infested with larvae of *C. sasalkii*, all young larval stage (L1~L4) did not tolerate longer than 30 min and the final instar larval lasted up to 90 min. Little phytotoxicity was detected after CATTS treatment for 60 min. A heat shock protein (*hsp90*) was expressed in response to heat (44℃) treatment. However, *hsp90* was not expressed in the larvae treated with CATTS for 60 min. These results suggest that CATTS can be applied against apples infested with *C. sasakii*.