Title Disinfestations of oriental tobacco budworm (*Helicoverpa assulta* G.) in green pepper (*Capsicum annuum* L.) by carbon dioxide fumigation without decreasing postharvest quality

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Abstract

The effects of carbon dioxide fumigation on control of oriental tobacco budworm were investigated in green pepper to develop an environmentally acceptable method for insect disinfestations. Green pepper (cv. Nokgwang) fruit were exposed to carbon dioxide at two concentrations (80 and 100%) in 0.08 mm polyethylene film bags for 24 and 48 h at room temperature (20°C). Percent fatality of oriental tobacco budworm larvae were determined after gas fumigation. The carbon dioxide fumigation at two concentrations for 24 h greatly reduced survival of the larvae, showing approximately 65% fatality when compared with control fruit. Prolonged fumigation of up to 48 h at both concentrations completely disinfested larvae. To identify the plausible deleterious effects of carbon dioxide fumigation on green pepper, fruit were stored at low temperature (10°C), and postharvest quality was analyzed for firmness, electrolyte leakage, respiration rate, and the content of vitamin C and capsaicin. There were no significant differences in postharvest fruit quality up to 20 days of storage compared with control fruit. Respiration rate of the fumigated pepper fruit was approximately half that of the controls after 20 days. These results suggested that carbon dioxide fumigation could disinfest oriental tobacco budworm without deteriorating postharvest quality in green pepper. The 80% carbon dioxide fumigation for 48 h is recommended as a reliable control means that is harmless to humans, and can alleviate concerns regarding pesticide residues.