

Title Comparison of susceptibility of two stored-product insects, *Ephestia kuehniella* Zeller and *Tribolium confusum* du Val to gaseous ozone

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Abstract

In this study, the susceptibility of two stored-product insects, *Ephestia kuehniella* and *Tribolium confusum*, to gaseous ozone was investigated. Two ozone fumigation methods were used, an empty space fumigation with only one flush of ozone treatment held for 2 h, and a reflush ozone treatment at 30-min intervals for 5 h in the presence of 2 kg wheat, with an initial ozone concentration of 13.9 mg/L. Toxicity data for empty space ozone treatments indicated a remarkable difference in susceptibility between the life stages of *E. kuehniella* and *T. confusum*. For *E. kuehniella*, empty space ozone treatment resulted in complete mortality of adults, pupae and larvae, while only 62.5% of the eggs were killed. For *T. confusum*, ozone treatment resulted in very low mortality of adults, pupae and eggs, ranging from 4.2 to 14.1% while only larvae had a high mortality (74%). Generally *T. confusum* was more tolerant to ozone treatment than *E. kuehniella*. Ozone flush treatment at 30-min intervals for 5 h resulted in almost complete mortality of all life stages of *E. kuehniella* placed in the top position of 2 kg wheat, whereas eggs of *E. kuehniella* placed in the bottom position of 2 kg wheat were hard to kill. For *T. confusum*, larvae placed in the bottom position of 2 kg wheat were easily killed, whereas eggs, pupae and adults survived.