

Title Toxicity of ethyl formate to adult *Sitophilus oryzae* (L.), *Tribolium castaneum* (Herbst) and *Rhyzopertha dominica* (F.)

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Abstract

Fumigations were conducted using a continuous flow-through laboratory process to maintain constant concentrations of ethyl formate and low levels (<0.8%) of respiratory carbon dioxide. The procedure minimised the effects of sorption by exposing test insects without media and minimised the effect of carbon dioxide by use of continuous flow. The concentration×time (*Ct*) products of ethyl formate for adult *Sitophilus oryzae*, *Tribolium castaneum* and *Rhyzopertha dominica* at 25 °C and 70% relative humidity for the 6 h exposure were, respectively: (1) LD₅₀ 107.8, 108.8 and 72.8 mg h L⁻¹ and (2) LD_{99.5} 207.4, 167.1 and 122.2 mg h L⁻¹. Endpoint mortality was reached within 24 h of initial exposure.