

## NOTE

### Effect of Carbon Dioxide Anesthesia on Imiprothrin Toxicity in German Cockroach (Blattodea: Blattellidae)<sup>1</sup>

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The use of carbon dioxide (CO<sub>2</sub>) as an anesthetic agent for insects is a convenient and widespread practice. Although normally considered harmless, exposure to CO<sub>2</sub> may have side effects that contribute to misinterpretations of experimental data. Brooks (1965) and Tanaka (1985) found that repeated exposures to CO<sub>2</sub> affected growth and adult size of the German cockroach, *Blattella germanica* (L.). Brooks (1965) noted that multiple 3-min exposures retarded growth rate, reduced adult weight, and decreased fecundity of *B. germanica*. Tanaka (1985), working with multiple 5-min exposures to CO<sub>2</sub>, found that the nymphal stages of *B. germanica* were prolonged. Freckleton & Wahlsten (1968) reported that CO<sub>2</sub> administered to *Periplaneta americana* (L.) immediately after a training session interfered with retention of a learned task when the insects were tested 24 h later.

Valles & Koehler (1994) studied the influence of CO<sub>2</sub> anesthetization on chlorpyrifos toxicity in the German cockroach. They found that CO<sub>2</sub> administered for up to 1 h did not increase chlorpyrifos toxicity, but that multiple CO<sub>2</sub>-induced knockdowns did increase toxicity. They concluded that CO<sub>2</sub> used once for <15 min, or fewer than five times of short duration (≈15 s) did not increase chlorpyrifos toxicity in the adult male German cockroach. The objective of this study was to determine the effect of varying the lengths of CO<sub>2</sub> exposure on the adult German cockroach's susceptibility to the knockdown agent imiprothrin.

Insecticide-susceptible *B. germanica* (Heal strain) were reared on water and commercial dog food under a photoperiod of 14:10 (L:D) h at a constant temperature of 26°C and 50% RH. Routine rearing conditions required that CO<sub>2</sub> be administered twice, at 1 and 4 wk after egg emergence to separate sexes and stage the colony developmentally. The exposure to CO<sub>2</sub> for each of these procedures lasted ≈2 min.

Experimental insects were collected by removing a harborage from stock colony containers and placing it into a knockdown chamber (30.0 × 30.0 × 10.0 cm). The knockdown chamber, containing a perforated floor for distribution of

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