Susceptibility of the Bed Bug *Cimex lectularius* L. (Heteroptera: Cimicidae) Collected in Poultry Production Facilities to Selected Insecticides

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**ABSTRACT** *Cimex lectularius* L. is a widespread hematophagous insect pest around the world and is currently experiencing a reemergence as a public health pest of concern. One possible source of bed bugs to the human environment is the movement of bed bugs from poultry facilities to human structures by poultry workers. No recent studies have been conducted on the susceptibility of this insect to a wide range of insecticides. In addition, populations of bed bugs from poultry facilities have not been screened against insecticides for over 15 yr. Adult bed bugs collected from three poultry facilities in northwest Arkansas were exposed for 24 or 48 h (25°C) to glass vials treated with various dilutions of 12 insecticides dissolved in acetone to determine the concentration–response relationship. The order of toxicity, from most to least based on the LC₅₀s was: λ-cyhalothrin, bifenthrin, carbaryl, imidacloprid, fipronil, permethrin, diazinon, spinosyn, dichlorvos, chlorfenapyr, and DDT. Significant differences in LC₅₀ and LC₉₀ values for diazinon was observed among the three populations due to the previous history of repeated exposure to a mixture of tetrachlorvinphos and dichlorvos over a 10 yr period when compared to the LC₅₀s of two populations that had been exposed to the tetrachlorvinphos and dichlorvos mixture during 2–3 flock cycles. Bed bugs in each of the three populations exhibited high levels of DDT resistance, LC₅₀ > 100,000 ppm, which confirms that resistance to this insecticide continues in bed bug populations. This study documents baseline toxicological data for 12 insecticides in three populations of bed bugs and provides the first data on bed bug susceptibility to fipronil, spinosyn, and imidacloprid.

**KEY WORDS** bed bug, *Cimex lectularius*, insecticide resistance

*Cimex lectularius* L. (Heteroptera: Cimicidae) is a hematophagous insect that can be a major pest in breeder poultry facilities (Axtell 1985) and has regained worldwide attention due to its recent resurgence into dwellings shared by humans. Both sexes feed on blood and require a blood meal for subsequent molts (Usinger 1966). Although active dispersal of bed bugs can be important, passive dispersal is almost exclusively their dispersal *modus operandi*. This species is easily translocated by passive dispersal and adapts to multiple hosts (Usinger 1966, Marshall 1981, Lehane 2005). Consequently, when host animals including

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