

CHLORTETRACYCLINE ENHANCES SURVIVAL OF LARVAL *ANOPLOPHORA GLABRIPENNIS* REARED ON ARTIFICIAL DIET

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Abstract

During production of Asian longhorned beetles, *Anoplophora glabripennis* (ALB), in the Otis Insect Quarantine Facility, problems with microbial (especially bacterial) contamination of the artificial larval diet were recurrent, despite attempts to introduce aseptic techniques into rearing protocols. This contamination appeared to be causing reduced survival of immature stages to the point where sustainability of the colony was, at times, jeopardized. In 2003, we initiated a study to see if addition of chlortetracycline-HCL could alleviate this problem. In the first generation of the test, addition of chlortetracycline-HCL at either 0.14% or 0.28% by weight of Ogura diet increased the survival of established larvae from 26% (to pupation) and 4% (to adult) on control diet to >60%. Establishment of neonates was low (~40% mortality before the first diet change) in the first generation, regardless of diet

treatment. In the second generation, improved handling and related procedures boosted establishment to >90% of larvae for all treatments. By 90 d into the second generation, however, mortality was already significantly greater for the control diet (~30%) than for the diet with antibiotic (still <10%). Adding antibiotic appeared to have little effect on development rate or weight of larvae. Our results to date suggest that addition of an antibiotic such as chlortetracycline to artificial diets for ALB larvae can substantially reduce dietary contamination and produce major improvements in survival. This may appear counter-intuitive, as microbial gut symbionts are typically thought to be important in the nutrition of wood-infesting insects. Additional handling and scheduling changes also produced sizeable improvements in survival and establishment of neonates on artificial diet.