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Billions and billions sold: Pet-feeder crickets (Orthoptera: Gryllidae), commercial cricket farms, an epizootic densovirus, and government regulations make for a potential disaster

DAVID B. WEISSMAN¹, DAVID A. GRAY², HANH THI PHAM³ & PETER TIJSSEN³

¹Department of Entomology, California Academy of Sciences, San Francisco, CA 94118. E-mail: gryllus@gmail.com

²Department of Biology, California State University, Northridge, CA 91330. E-mail: dave.gray@csun.edu

³INRS-Institut Armand-Frappier, Laval QC, Canada H7V 1B7. E-mail: hanh.pham@iaf.inrs.ca; peter.tijssen@iaf.inrs.ca

Abstract

The cricket pet food industry in the United States, where as many as 50 million crickets are shipped a week, is a multi-million dollar business that has been devastated by epizootic *Acheta domesticus* densovirus (AddDNV) outbreaks. Efforts to find an alternative, virus-resistant field cricket species have led to the widespread USA (and European) distribution of a previously unnamed *Gryllus* species despite existing USA federal regulations to prevent such movement. We analyze and describe this previously unnamed *Gryllus* and propose additional measures to minimize its potential risk to native fauna and agriculture. Additionally, and more worrisome, is our incidental finding that the naturally widespread African, European, and Asian “black cricket,” *G. bimaculatus*, is also being sold illegally in southern California pet food stores. We assayed crickets of all five USA and European commercial species for presence of the AddDNV to document extent of the infection—all five species can be infected with the virus but only *A. domesticus* is killed. Based on its already cosmopolitan distribution, apparent inability to live away from human habitation, and resistance to AddDNV, we suggest that *Grylloides sigillatus* is the best-suited replacement cricket for commercial production.

Key words: field crickets, *Gryllus*, *Acheta*, AddDNV, *Grylloides*, cryptic species, densovirus, pet food stores, commercial cricket breeders, bar coding, USDA/APHIS

Introduction

The USA commercial cricket industry supplies, yearly, billions of live crickets as food and bait to pet stores, educational facilities, and individuals. Several USA facilities ship 5 million crickets a week (C. Ghann, pers. comm. to DBW, August, 2011) and are important economic engines because they provide many jobs to both on-site workers and the overnight shipping industry. On the web, one can purchase, from several suppliers, 1,000 live crickets for between \$10–20. A frequently kept large lizard, such as the bearded dragon, can consume 50–100 adult crickets a day (H. Labe, pers. comm. to DBW, June, 2011). Plus, raising crickets has recently been touted as a way to make easy money (Gillman 2011).

In March, 2011, DBW was asked to review the Center for Plant Health Science and Technology (CPHST) Version 1.0 (Meissner & Ahern 2011) of a United States Department of Agriculture (USDA)-Animal and Plant Health Inspection Service (APHIS)-Plant Protection and Quarantine (PPQ) requested risk assessment for the importation of the field crickets *Acheta domesticus* (L.) and *Gryllus assimilis* (F.) from Europe. This cricket-grower request to import was in response to outbreaks of *A. domesticus* densovirus (AddDNV) in USA commercial *A. domesticus* colonies that had resulted in several cricket operations going into bankruptcy (see Coote 2004 and Hudak 2010, for examples).

This publication is the result of a one plus year investigation involving scientists on six continents, the USDA, agriculture officials in several states, and commercial cricket breeders in both the USA and Europe. It is directed toward the mixed audience of scientists, commercial cricket growers, and government regulators to permit an