Epidemiology and Spatial Relationships of Bacteria Associated with *Periplaneta americana* (Blattodea: Blattidae) in Central Texas

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ABSTRACT

Identifying cockroach (Order: Blattodea) populations is important to understanding the ability of surrogate species indirectly affecting humans by their ability to vector disease-causing organisms including bacteria. These interactions may have potentially deleterious health consequences on animal and/or human populations. In this study, American cockroaches, *Periplaneta americana* were sampled from 12 locations throughout College Station, Texas from January through May 2008. Cockroach distribution was examined as well as prevalence of *Escherichia coli* including the O157:H7 strain and *Campylobacter* spp. on their external surfaces.

Bacteria isolated from total populations collected indicated a high prevalence (92.3%) of microbes carried on the exoskeleton of *P. americana*. Gram-negative bacteria acquisition and dissemination of organisms such as *E. coli* was prevalent throughout the campus. Screening for *E. coli* O157:H7 and *Campylobacter* spp. resulted in no positive colony growth. The lack of *Campylobacter* spp. growth from cuticular surfaces may have resulted from undesirable conditions required to sustain colony growth. Data from this study corroborate the potential ability of cockroaches to mechanically transmit pathogens.

KEY WORDS

*Periplaneta americana*, *Campylobacter* spp., *Escherichia coli*, central Texas

Cockroaches (Order: Blattodea) are important vectors of pathogens due in part to their unsanitary lifestyle. Cockroach cuticle can harbor several *Enterobacteriaceae* species including *Salmonella* spp., *Klebsiella* spp., and *Escherichia* spp. (Mpuchane et al. 2006). A few medically important pathogens that can be vectored by the American cockroach, *Periplaneta americana* (Linnaeus) (Blattodea: Blattidae), include: *Campylobacter* spp., *E. coli*, *Salmonella* spp., *Shigella* spp., *Staphylococcus* spp., *Streptococcus* spp., and *Toxoplasma gondii* (Barcay 2004). Cockroaches are also able to transmit pathogens such as anthrax, cholera, diphtheria, pneumonia, tetanus, and tuberculosis (Baumholtz et al. 1997). Many of which could be used as bioterrorism agents targeting animal or human populations (Lane et al. 2001, Moran 2002).

Understanding the nature of pathogen transmission from urban insect pests to humans could clarify the epidemiology of many illnesses. The epidemiology of

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