Antibiotic resistant enterococci in laboratory colonies of stored-product insects and from insects collected from different storage habitats

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Goals:

(1) Isolation, quantification, and diversity assessment of antibiotic resistant enterococci associated with laboratory colonies of stored-product insects and their diets  
(2) Isolation, quantification, diversity and antibiotic resistance of stored product insects and products collected from various storage environments throughout the supply chain.

Statement of Problem:

Globally, stored grain products are infested with many different insect species. They cause significant economic losses every year from feeding on cereal crops. In addition to infesting cereals of various types they are reservoirs for potentially pathogenic bacteria that can be transmitted into the cereals. Prevalent pathogens hosted by store grain insects include Salmonella spp., Eschericia coli, Streptococcus spp., and Enterococcus spp., in addition to many others. Enterococcus bacteria are gram positive, catalase negative cocci that are ubiquitous in the environment. Most of the Enterococcus are harmless to humans but several can cause human diseases. They can also carry antibiotic resistant genes and are able to transfer these to other pathogenic bacteria, such as Salmonella. Antibiotic resistant enterococci are prevalent in feed mill environments where antibiotics are commonly used in feed production. Stored product insects living in feed lots, silos and processing facilities can pick up and contain Enterococcus bacteria in their gut microflora. There is little research concerning where classifying antibiotic resistance Enterococci is more prevalent in the environment. The questions this project intends to address is whether Enterococci antibiotic resistance development is limited to feed lots or can it extend into grain silos and processing plants as well? Very little is known about antibiotic resistant enterococci associated with laboratory colonies of stored-product insect species and the diets used for rearing them.

Current Activities:

Current laboratory insect colonies and their diets are being analyzed to determine diversity of enterococcal species and their resistance to antibiotics used in clinical settings.
Recent Publications: