ANALYSIS OF mtDNA SEQUENCE DATA FOR THE ASIAN LONGHORNED BEETLE (*ANOPLOPHORA GLABRIPENNIS*): EVIDENCE FOR MULTIPLE INVASIONS IN NORTH AMERICA

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Anoplophora glabripennis (Motschulsky), known as the Asian longhorned beetle (ALB) in the United States, is an invasive forest pest. This wood-boring beetle, first detected in New York City in 1996, in Chicago in 1998, in Toronto in 2003, and in New Jersey in 2002 and 2004, was accidentally introduced to the United States in solid wood packing materials and is a significant threat to our urban and natural forests.

Sequence data from mitochondrial COI and COII were edited and trimmed to 1645 characters. Data analysis was carried out with PAUP 4.0b10 using neighbor joining. All characters were weighted equally.

The mtDNA haplotype of beetles from Carteret, NJ differed from that of New York City/Jersey City beetles by 18 nucleotide sites, from that of Toronto beetles by 17 nucleotide sites, and from the Chicago/New York City mtDNA haplotype by 4 nucleotide sites. Ranking them in terms of genetic distance from the New York City/Jersey City, population, we have the Chicago/New York City mtDNA haplotype most similar (4 different nucleotide sites) followed by the Toronto mtDNA haplotype (7 different nucleotide sites) followed by the Carteret mtDNA haplotype (18 nucleotide sites) as indicated by clade distances.

We show that beetles from the Toronto and Carteret populations each has its own unique mtDNA haplotype. This suggests that these invasions were initiated separately from each other and from the primary New York/Jersey City invasion. This data does not support the hypothesis that beetles dispersed from New York City/ Jersey City to Carteret.

All of the Jersey City beetles share only one of the two mtDNA haplotypes found in the New York City beetles. This might indicate that one or only a few beetles spread from one of the populations in Queens to found the Jersey City population, and that it was not a separate introduction event.

We can say that two distinct haplotypes invaded New York. They must have been introduced from distinct source populations or from one heterogeneous population. Research is ongoing to sample potential source populations across China and Korea.