2.1 Phylogeographic and Population Genetic Studies Uncover Two Founding Events in Asian Citrus Psyllid Populations Collected in the Americas


1USDA, ARS, Weslaco, TX, USA
2Citrus Center Texas A&M University - Kingsville, Weslaco, TX, USA
3Estación Experimental Agroindustrial Obispo Colombres (EEAOC), Tucumán, Argentina
4Instituto Nacional de Investigación Agropecuaria (INIA), Salto, Uruguay
5Instituto Nacional de Tecnología Agropecuaria (INTA), Bella Vista, Corrientes, Argentina
6Escola Superior de Agricultura ‘Luiz de Queiroz’/USP, Piracicaba, São Paulo, Brazil
7USDA, ARS, SABCL, Buenos Aires, Argentina
8Private Contractor, Itapúa, Paraguay

A phylogeographic analysis inferred from the partial mitochondrial cytochrome oxidase subunit I gene (433 bp) was performed with 22 populations (n = 132) of *Diaphorina citri* collected in the Americas and one in the Pacific. Eight populations (n = 46) from four countries in South America, 14 (n = 76) from four countries in North America, and one from Hawaii (n = 10) were analyzed. Twenty-three haplotypes (hp) were identified that fell into two groups, hp1-8 were identified in South America (Group 1) and hp 9-23 were identified in North America and Hawaii (Group 2). Hp1 and 9 were present in the highest frequencies within each population and within their group, 81-85%. Sharing of haplotypes was not observed between the two groups. An analysis of molecular variance uncovered significant genetic structure (ΦCT = 0.733; P < 0.001) between the two groups in the Americas. A neighbor-joining phylogram and two haplotype networks (Parsimony Splits and Statistical Parsimony) discriminated the two groups, while both networks identified hp1 and 9 as the ancestral or founding haplotypes within their respective group. Significantly negative neutrality tests (Tajima’s D and Fu’s Fs), non-significant mismatch distribution parameters (SSD and HRI), and low genetic diversity levels provided evidence of demographic expansion within each group in the Americas. The data suggest that two founding events of *D. citri* occurred in the Americas, one in South America and one in North America. Furthermore, North America and Hawaii appear to share a similar source of invasion. These data are important to the development of biological control programs against *D. citri* in the Americas.