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Stylet Morphometrics and Ultrastructure in Relation to Feeding Behavior and Pathogen Transmission by Nymphs and Adults of the Asian Citrus Psyllid *Diaphorina citri*, Vector of Citrus Huanglongbing Bacterium

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The feeding behavior and stylet morphometrics were studied in nymphs and adults of the Asian citrus psyllid (ACP), *Diaphorina citri* (Hemiptera, Psyllidae), vector of *Candidatus Liberibacter asiaticus* (Las) associated with citrus huanglongbing (HLB) disease. The stylet length of first instar nymphs averaged 266 μm (83% of body length) whereas that of 5th instar nymphs was 615 μm (34% of body length). Younger ACP nymphs feed only on young citrus leaves on smaller veins or on the sides of the midrib, whereas adults can feed anywhere on the veins of young or old citrus leaves. Epifluorescence microscopy of cross sections in citrus leaves indicated that the thick-walled fibrous layer around the phloem is much more prominent in older than in younger leaves. Additionally, first instar nymphs can reach the phloem because the distance to the phloem is shorter from the sides of the midrib compared to that from the top, and is considerably shorter in younger than in older/mature leaves. Ultrastructural studies on ACP stylets show that the width of the maxillary food canal in first instar nymphs is wide enough for Las bacteria to go through during food ingestion (and Las acquisition). However, the width of the maxillary salivary canal in first instar nymphs may not be wide enough for Las bacteria to go through during salivation (and inoculation of Las bacterium) into host plants. This may explain previous studies indicating that older ACP nymphs and adults can transmit HLB bacterium whereas younger nymphs probably cannot.