

EFFECTS OF STARVATION ON PROBING BEHAVIOR OF THE ASIAN CITRUS PSYLLID, *DIAPHORINA CITRI*

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Some hemipterans undergo periods of starvation in the absence of host plants or during migratory flights, which may result in changes in physiology and feeding behavior. *Diaphorina citri* Kuwayama (Hemiptera: Psyllidae), an important vector of phloem-restricted bacteria associated with citrus huanglongbing (HLB), is an oligophagous psyllid with host range restricted to a few genera in Rutaceae, and may experience starvation if adults move long distances searching for host plants or citrus groves. Although *D. citri* is a typical phloem feeder, a previous study indicated that starved adults often ingest xylem sap. By using the electrical penetration graph (EPG) technique, we investigated changes in probing behavior of this psyllid vector after increasing periods of starvation (0, 6, 12 and 24 h). For each starvation treatment, 15 adult females (4-6 days old) were recorded for 5 h on seedlings of *Citrus sinensis* (L.) Osbeck using a Giga-8 DC-EPG monitor. Except for a reduction in the number of probes in the first hour of probing, most starvation effects were observed on EPG parameters related to the xylem and phloem phases of probing. The percentage of insects that performed waveform G (putative xylem ingestion) increased from 28.6 (non-starved) to 53.3, 93.3 and 80% when starved for 6, 12 and 24 h, respectively. The number of G waveform events was significantly higher in insects starved for at least 12 h, whereas the mean duration of G per event increased in all starvation treatments. On the other hand, non-starved insects started phloem ingestion (waveform E2) faster than starved ones. Some individuals did not reach the phloem phase during the 5-h recording time after starved for 12 h (26.7%) or 24 h (13.4%), whereas all non-starved ones did. Interestingly, mean durations of waveforms D (phloem contact) and E1 (waveform that precedes phloem ingestion) were significantly reduced in starved insects, regardless of the starvation period. Overall, the data indicate that long starvation periods (≥ 12 h) induce most *D. citri* adults to ingest xylem sap before the phloem phase, delaying the onset of phloem ingestion. These starvation-mediated changes in probing behavior, if common in migrating psyllids, may have implications on the efficiency of systemic insecticides that are transported through the xylem vessels.

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