

A waveform library for *Culex tarsalis* mosquitoes probing on human hands

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Culex tarsalis Coquillett (Diptera: Culicidae) mosquitoes transmit numerous pathogens affecting human and animal health. Unfortunately, the probing behaviors of mosquitoes are poorly understood. However, the recent development of AC-DC electropenetrography (EPG) procedures for blood-feeding arthropods now allows for the study of mosquito probing and ingestion behaviors in unprecedented detail. To this end, we constructed a waveform library for *Cx. tarsalis* feeding on human hands. Waveforms representing different probe phases were characterized and defined by visual and video observations of biological activities and analyzed for differences in appearance across four input resistance (R_i) levels and two current types to determine the electrical origins of the waveforms. An R_i level of 10⁷ Ohms with an applied signal of 150 millivolts alternating current provided the best results. Waveforms for *Cx. tarsalis* included those previously identified in *Aedes aegypti* L. (Diptera: Culicidae): waveform families J (surface salivation), K (stylet penetration through the skin), L (types 1 and 2, ingestion site exploration), M (types 1 and 2, ingestion), N (type 1, an unknown behavior which may be a resting and digestion phase), and W (withdrawal). However, we also observed variations in the waveforms not described in *Ae. aegypti*, which we named types L3, M3, M4, and N2. This investigation expands our understanding of mosquito probing behaviors. We expect it to facilitate future pathogen transmission studies and help identify new pest and pathogen management targets.