

WAVEFORM LIBRARY FOR CHINCH BUGS (HETEROPTERA: LYGAEIDAE): CHARACTERIZATION OF EPG WAVEFORMS AT MULTIPLE INPUT IMPEDANCES

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Chinch bugs, *Blissus* spp. (Heteroptera: Blissidae), are among the most serious pests of grasses in North America. Southern chinch bug, *B. insularis* Barber, is the most important pest on St. Augustine- grass, the primary lawn grass in Florida. Western chinch bug, *B. occidentalis* Barber, is a key pest on wheat and buffalograss, a common lawn grass in the western USA. Resistant grass and wheat cultivars have reduced chinch bug damage below economic thresholds for many years; however, resistance has often failed recently, and research efforts are underway to develop new grass cultivars resistant to these pests. Past studies have shown that chinch bugs are salivary sheath feeders that ingest primarily from phloem sieve elements. To support concurrent studies using electrical penetration graph (EPG) to compare chinch bug feeding among resistant and susceptible grass accessions, EPG waveforms were recorded for the first time for *B. insularis* and *B. occidentalis* using a 4-channel version of the Backus and Bennett AC-DC EPG monitor. Waveforms were characterized for both AC and DC applied signals, using input impedances of 10^6 , 10^7 , 10^8 , 10^9 and 10^{13} (“emf only”) Ohms. A matrix of waveform appearances (a “waveform library”) at both types of applied signal and all input impedances is provided. Electrical origin (R, emf or both components of the output signal), voltage levels, repetition rates, and waveform appearances are provided for waveform types described. An input impedance of 10^7 Ohms, using either AC or DC applied signal, appears to provide the best balance of R and emf components, for future studies. Although histological and biochemical correlations were not performed, tentative biological meanings are assigned based on similarity to many other species’ waveforms. Three putative pathway waveforms, two putative ingestion waveforms, and a hypothesized X-wave are characterized.

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