

Characterization and correlation of the probing behaviors of *Macrostelus quadrilineatus* (Hemiptera: Cicadellidae) with EPG waveforms

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Aster leafhopper (*Macrostelus quadrilineatus* Forbes) is a polyphagous insect species that migrates into the upper Midwest of the United States and the Western Canadian Prairies. Populations of this insect are associated with the transmission of a plant pathogen (*Candidatus* *Phytoplasma asteris*, 16SrI) to several annual crops and perennial plant species. Previous studies suggest that aster leafhoppers can sometimes prefer less suitable hosts for their development and survival, yet it is unclear if this lower performance on certain plant species is associated with reduced or impaired probing behaviors due to characteristics of the plants. To characterize the probing behaviors of aster leafhoppers, direct current EPG recordings of male and female adults on barley (*Hordeum vulgare* L.) were combined with plant histology, allowing the identification of nine waveforms and their proposed biological meanings. For each waveform, the number of waveform events per insect (NWEI), the waveform duration per insect (WDI), the waveform duration per event per insect (WDEI), and the percentage of recording time (PRT) were calculated and statistically compared between sexes. Male and female aster leafhoppers exhibited similar behavioral responses for most of these variables, except for the NWEI for waveforms associated with non-probing activities and the pathway phase. In these cases, male aster leafhoppers exhibited a higher number of events than females. Comparison of the proposed waveforms in this study with previous work on other hemipteran species provided additional support to the interpretation of the biological activities associated with each waveform.