The probing behavior and vector potential of *Melanaphis sacchari* in transmitting *Sorghum mosaic virus*

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The electrical penetration graph (EPG) technique has been essential in understanding the behavioral activities behind transmission of noncirculative plant viruses (i.e., virus particles attached to the cuticular lining of vector mouthparts or foregut) like potyviruses. *Sorghum mosaic virus* (SrMV) is a potyvirus that causes mosaic symptoms in Poaceae, such as sugarcane and sorghum, reducing yields. In 2013, *Melanaphis sacchari* (Zehntner), host switched from being a pest of sugarcane to causing economic losses in sorghum. Colonies can reach as many as 10,000 individuals on a single sorghum plant. The sheer numbers of *M. sacchari* pose a risk for plant virus epidemics. Thus, we designed laboratory experiments to understand the potential of *M. sacchari* to vector SrMV in sorghum. Virus transmission efficiency of sugarcane aphid was studied in comparison to the green peach aphid, *Myzus persicae* (Sulzer). In addition, EPG studies were conducted to characterize probing behaviors of *M. sacchari* and *M. persicae* on virus-infected and non-infected sorghum to determine if there were differences in behaviors that could correlate with their respective SrMV transmission efficiencies. Transmission of SrMV differed among the two aphid species with *M. sacchari* failing to transmit. Probing behaviors suggested that by virtue of producing higher numbers of probes, longer potential drop durations with longer subphases II-1 and II-3, higher numbers of archlets during subphase II-3, and quicker times to first potential drop than *M. sacchari*, *M. persicae* possesses an ability to successfully transmit SrMV from sorghum to sorghum.