

APHID - PHYTOVIRUS INTERACTIONS: INVESTIGATION OF VIRUS BINDING MECHANISMS IN INSECT VECTORS BY LECTIN USE AND PROTEOMIC APPROACH

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Aphids are well known for their role in virus transmission to host plant. In some cases, the virus is transmitted from plant to plant simply attached to the cuticle of the mouthparts or the foregut. For other, circulative virus transmission based on virion internalization through the aphid gut followed by transfer to salivary glands and finally to next plant during aphid feeding is required. In both situations, presence of receptor components through the digestive tract of the aphids is needed for virus binding and further transmission to next plants even if not localized at the same place. In order to investigate the specific binding of virus on particular aphid receptors, two aphid-virus models were selected to be tested using several lectins showing differential sugar binding specificities. Virus transmission efficacy assays with *Myzus persicae* and potato virus but also *Acyrtosiphon pisum* and pea enation mosaic virus were performed using a range of lectins to assess the potential competition of lectins and virus. Some interesting lectins were found to reduce the virus transmission with a 2 fold factor showing potential use of lectin in virus spread control. The aphids were also investigated by a proteomic approach using a two Dimension-Differential In Gel Electrophoresis (2D-Dige) coupled with mass spectrometry to determine the aphid proteins involved in virus transmissions. Head or digestive tubes of aphids were collected and investigated for non persistent or persistent virus models respectively. Differential abilities of aphids to transmit the selected virus models are discussed in relation with lectin affinity specificity and investigated aphid proteins found to be involved in vector-virus interactions. The application of lectin as potential way to reduce virus transmission by aphids will also be developed.