

Physiology

Investigation Of Lectins As Competitors Of Virus In Aphids And Potentiality In Viral Disease Transmission

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Awareness of the danger of the excessive use of pesticides to human health and the environment has led to some scientific research to develop alternative strategies for pest management. All these investigations aim to reduce the massive use of toxic chemicals. In order to have efficient control of viral diseases by reducing the aphid vector dispersion virus transmission efficiency, some interesting glycoproteins such as lectins were found to be potential competitors to virus. Indeed, these proteins present large affinity to receptors located from the sucking mouth parts to the hindgut of the vector aphids. In this study, the effects of three lectins on the transmission of three non-persistent viruses were tested in laboratory on *Myzus persicae* via the use of artificial diets. The glycoproteins used were *Canavalia ensiformis* agglutinin (ConA), *Galanthus nivalis* agglutinin (GNA) and wheat germ agglutinin (WGA) and the viruses studied were PVY (Potato virus Y), CMV (Cucumber Mosaic Virus) and TuMV (Turnip Mosaic Virus). An interference between GNA and all viruses was observed. In addition, a competition between WGA and two viruses i.e. CMV and TuMV was highlighted. In consequence, the two latter lectins were considered as promising proteins to reduce the transmission of these viruses. Strategies based on pre-feeding aphids with lectins before potential virus transmission and application in fields were discussed in terms of sustainable and efficient reduction of viral disease in crops.

Keyword : Aphid-virus interaction, lectins

