

Is the Acrostyle of aphid stylets a universal transport device for non-circulative viruses?

Marilyne UZEST, Daniel GARGANI, Craig WEBSTER, Rodrigo ALMEIDA, Maëlle THILLIER, Sophie LE BLAYE & Stéphane BLANC

Hundreds of plant virus species with major agricultural and economical impacts are transmitted by aphids in a non-circulative manner : they are retained on attachment sites within the insect maxillary stylets, and subsequently released when aphids feed for inoculation into new host plants. Highly specific interactions between viruses and their vectors are involved in this reversible attachment process. Working on aphid stylets still represents a major bottleneck to the identification of receptors, and despite considerable efforts only those from the *Cauliflower mosaic virus* were partially characterized to date. These receptors are located in a newly identified organ, the Acrostyle, present in the common canal at the extreme tip of the maxillary stylets. We showed that this organ contains cuticular proteins from the RR2 family. Its physiological role remains totally unknown. However, because it's the only distinctive feature present at this location, and because we have shown that at least one virus can use it as a natural affinity chromatography device, for binding and release during transmission, we propose the Acrostyle could transiently promote the binding and release of other compounds, from the plant (eg:toxic molecules) or from the aphid saliva (eg: effectors counteracting plant defences), and thereby play a role in aphid/plant compatibility. Research is currently underway to determine whether this organ plays a role in the transmission of the *Cucumber mosaic virus*. The most recent advances will be presented and discussed.