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Ampelovirus and Vitivirus relationships in grapevine

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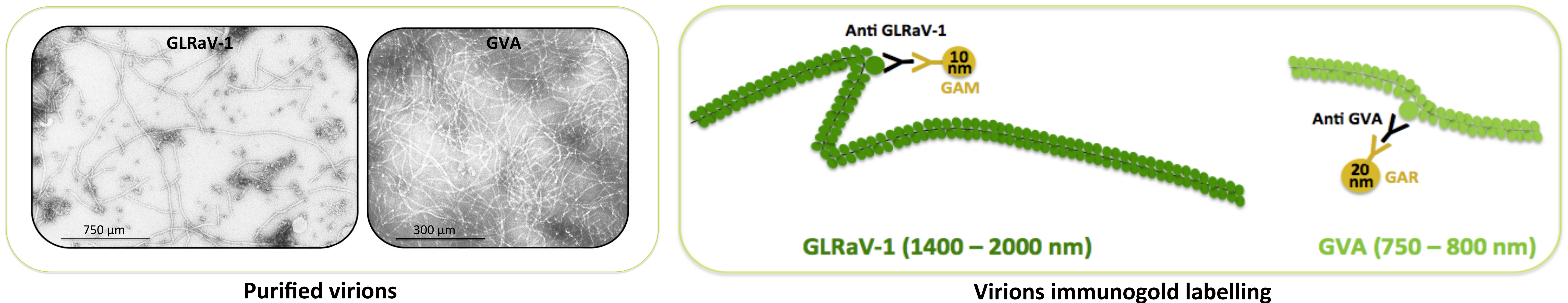
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Grapevine leafroll-associated virus 1 (GLRaV-1, *Ampelovirus*) and *Grapevine virus A* (GVA, *Vitivirus*) are composed of flexuous particles enclosing a positive single strand RNA of 18.7 Kb and 7.5 Kb, respectively. GLRaV-1 and GVA are restricted to vascular tissues of host plants and their transmission by mealybugs has been shown to fulfill the criteria of a "semi-persistent and non-circulative" mode (Tsai *et al.*, 2008).

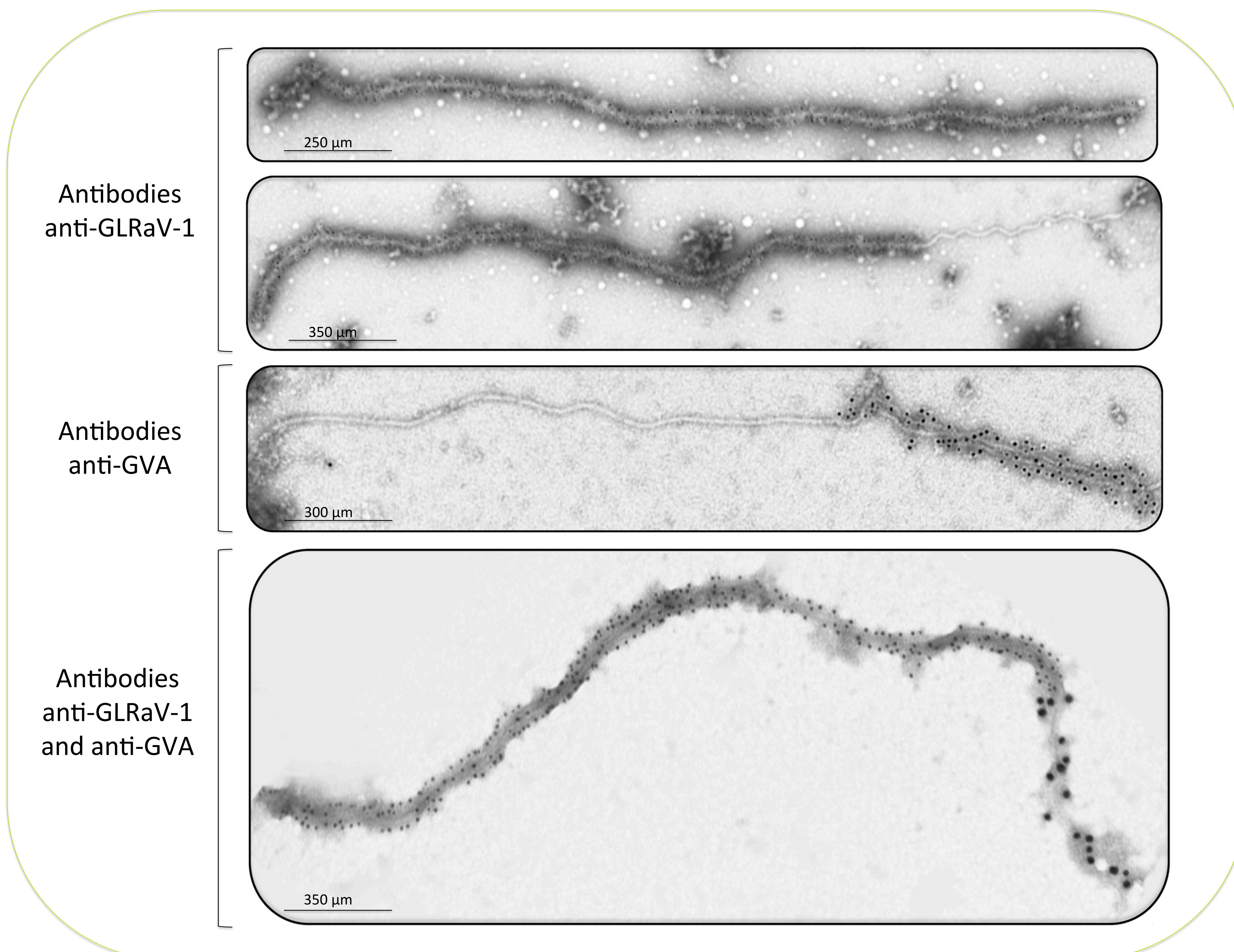
Previous studies grapevine viruses shed light on frequent co-infections with one or more *Ampelovirus* species, and *Vitivirus* species, while mono-infections of grape with *Vitivirus* are known but rare (Blaisdell *et al.*, 2015). These observations on such a close association in grape led us to suggest an assistance between *Ampelovirus* and *Vitivirus* virions during mealybug transmission (Hommay *et al.*, 2008).

Method

Immunogold labelling on virions from co-infected grape accession was used to establish GLRaV-1 and GVA relationships in grapevine.



Results and Conclusion



Immunogold labelling of purified virions from a co-infected (GLRaV-1 and GVA) grapevine accession

Results display on two types of GLRaV-1 virion structures in purification from co-infected grapevine accession : virions entirely labelled by anti-GLRaV-1 antibodies, and « hybrid » virions double labelled by both antibodies

Such double labelled virions may reflect an original association between the two viruses, which may play a role in mutual assistance between both of them.

Further investigations will determine the prevalence of this hybrid structure, the nature of this assistance or/and its existence among other *Ampelovirus* and *Vitivirus* species, as well as its consequences on transmission biology

References

- Blaisdell, G.K., Zhang, S., Bratburd, J.R., Daane, K.M., Cooper, M.L., Almeida, R.P.P., 2015. Interactions within susceptible hosts drive establishment of genetically distinct variants of an insect-borne pathogen. *Journal of Economic Entomology*, 108: 1531-1539.
- Hommay, G., Komar, V., Lemaire, O., Herrbach, E., 2008. Grapevine virus A transmission by larvae of *Parthenolecanium corni*. *European Journal of Plant Pathology*, 121: 185-188.
- Tsai, C.W., Chau, J., Fernandez, L., Bosco, D., Daane, K.M., Almeida, R.P.P., 2008. Transmission of grapevine leafroll-associated virus 3 by the vine mealybug (*Planococcus ficus*). *Phytopathology*, 98: 1093-1098.