

Möglichkeiten der Bekämpfung der Tomaten-Miniermotte mit Baculoviren

Potential of Control of the Tomato Leaf Miner with Baculoviruses

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The tomato leaf miner *Tuta absoluta* is a severe pest in field and green house production of tomato. Because of increasing resistance to chemical insecticides, biological alternatives are needed to control this pest insect. In the framework of the EU project BIOCOMES the potential of the baculovirus *Phthorimaea operculella-granulovirus* (PhopGV) has been evaluated in laboratory and field experiments.

T. absoluta Control Consortium within Biocomes project:



Pest

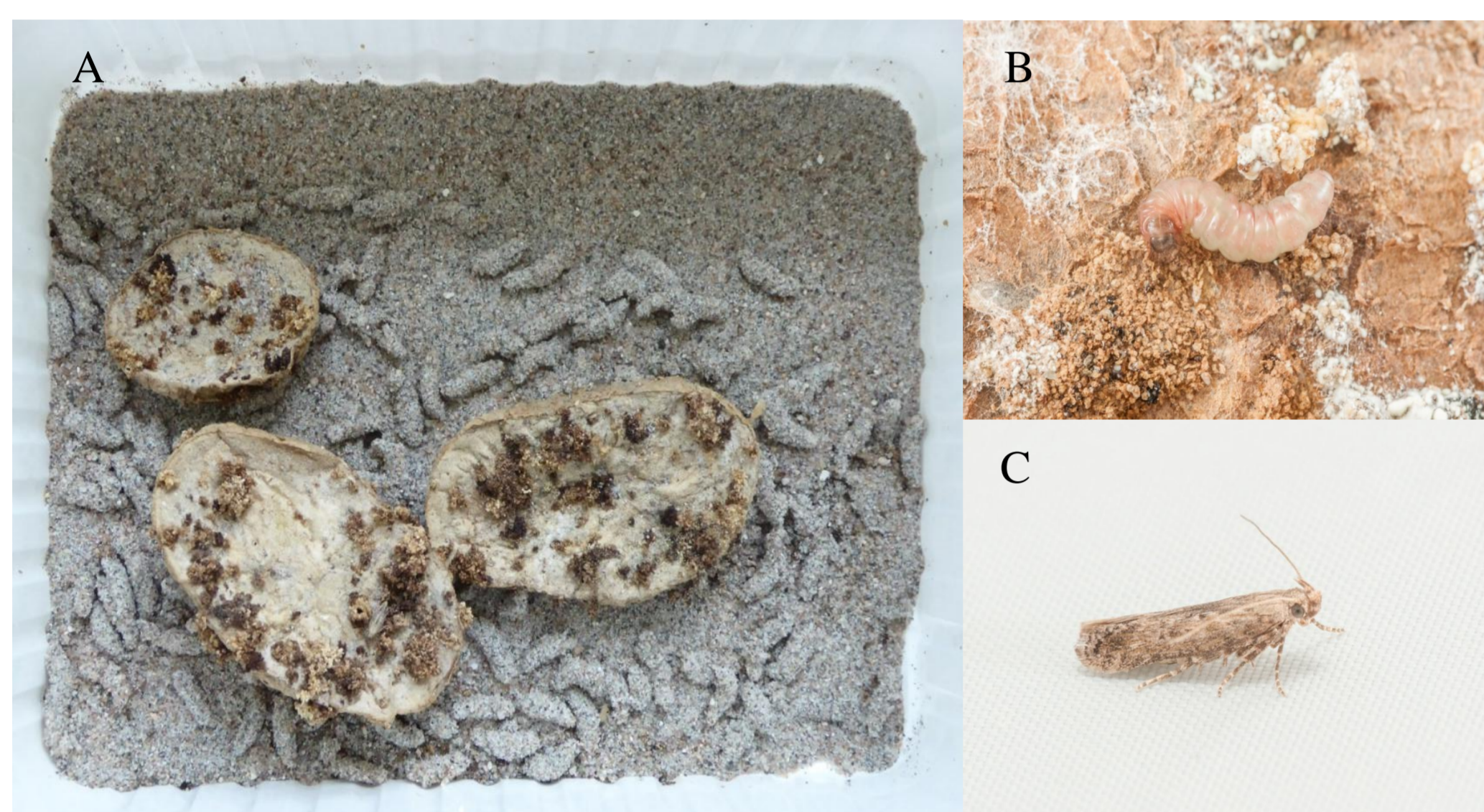


Fig. 1: *P. operculella* pupae and damage on potato tubers (A). Caterpillar on potato (B) and moth (C).

Solanaceae (potato, tomato, eggplant etc.) are important for world crop production but get highly affected by caterpillars of Gelechiidae. Leaves, tubers and fruits are mined by *Phthorimaea operculella* larvae. *Tuta absoluta* larvae injure potato plants and favorably tomato plants and fruits.

Possible Control Agent

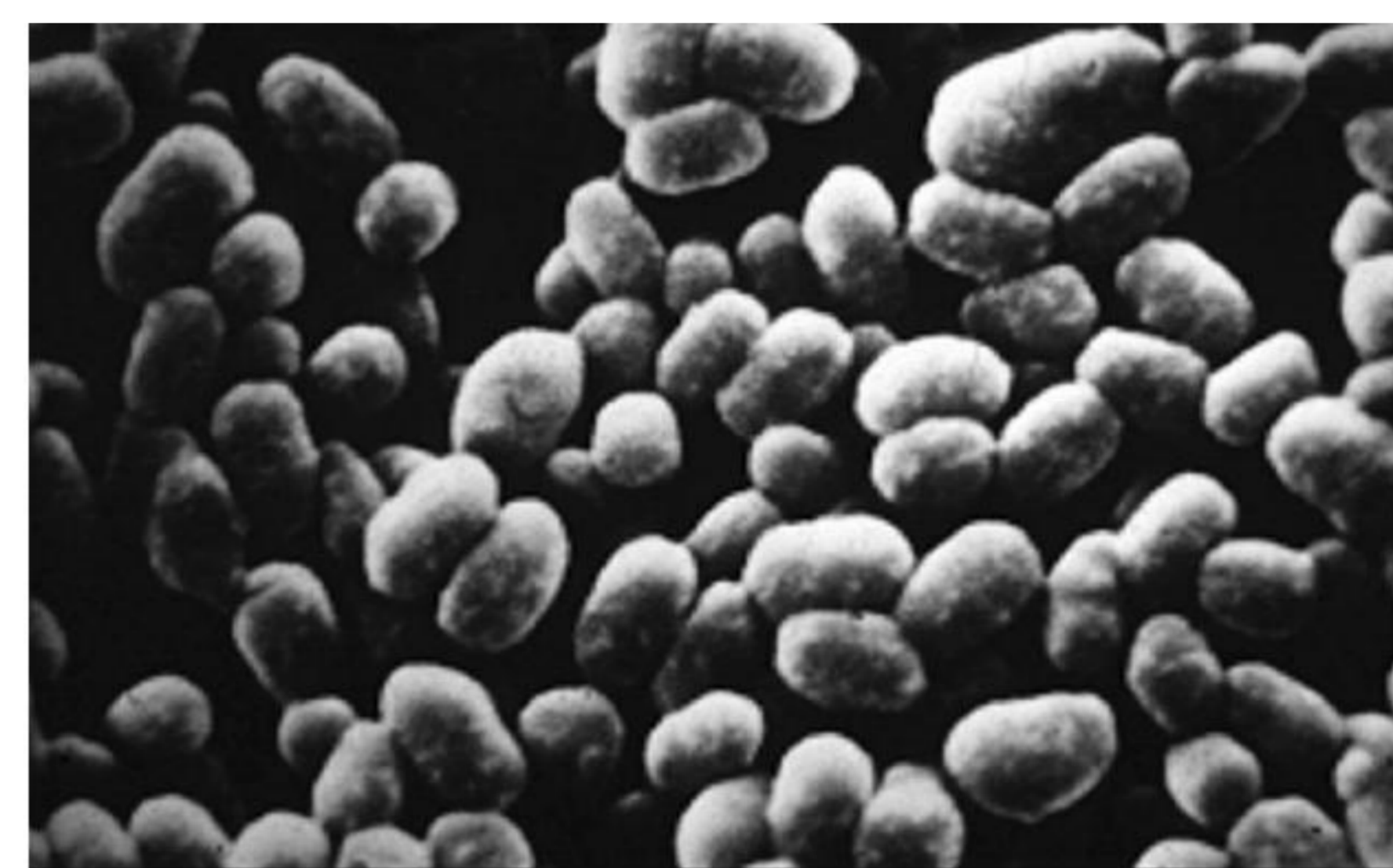


Fig. 2: PhopGV occlusion bodies (Foto: Centro Internat. de la Papa, Lima, Peru).

Baculoviruses are specific and not harmful for the environment. PhopGV is a *Betabaculovirus* with a genome size of 119.217 bp and consists of 130 ORFs. The usage of PhopGV to stop the feeding and to kill the damaging caterpillars is an opportunity to save crops and prevent high economic losses.

Biological Activity of the PhopGV Isolates

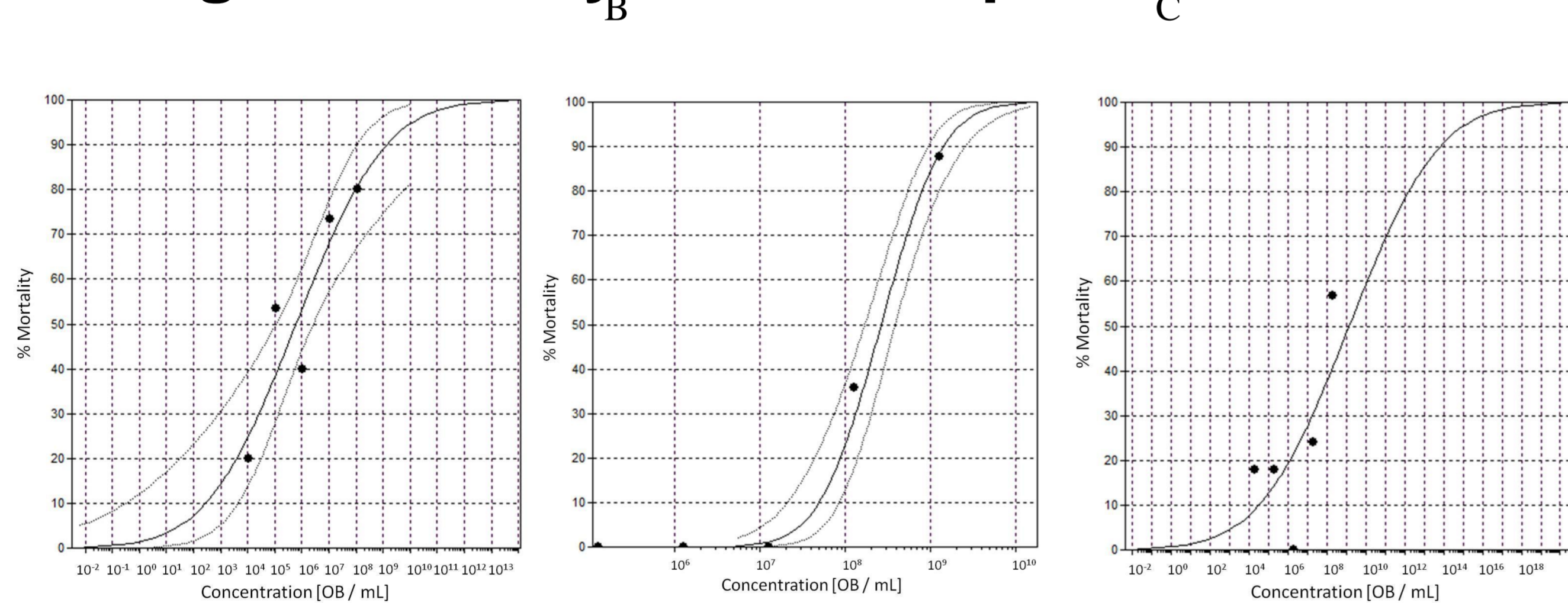


Fig. 3: Mortality curves of three PhopGV isolates from Costa Rica. CR1 (A), CR3 (B) CR5 (C). Data (●); Function (—); 95 % con. lim. (---)

Bioassays were used to test the virulence of different PhopGV isolates against *P. operculella* larvae as well as *T. absoluta* larvae.

Molecular Characterization of PhopGV Isolates

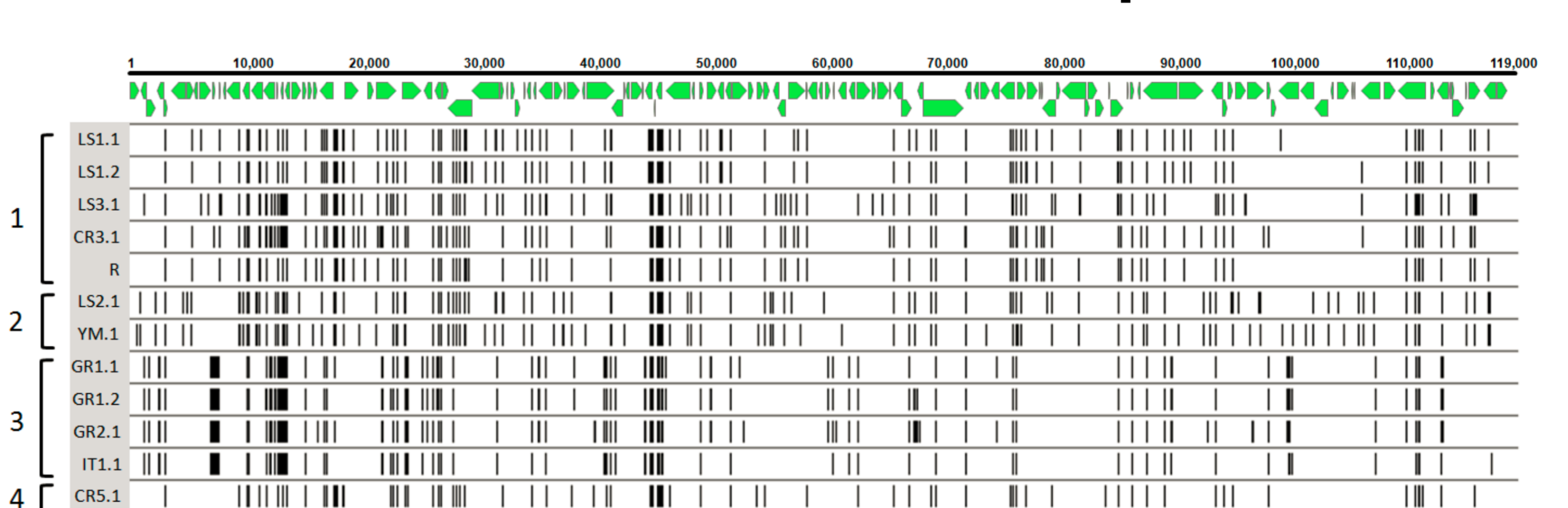


Fig. 4: SNP mapping of 12 sequenced PhopGV isolates used for identification and classification of PhopGV isolates.

12 PhopGV isolates from different geographic origins were analysed by DNA REN mapping and full genome NGS sequencing. Single nucleotide polymorphism (SNPs) were identified to distinguish different isolates.

Conclusions

After confirmation of high control efficacy by PhopGV in greenhouse and field experiments by our project partners a new product, termed Tutavir®, is being

developed by Andermatt Biocontrol as an outcome of the project. It is expected that Tutavir® will be available as biocontrol agent of *T. absoluta* after its registration.

References:

- Larem, A., Fritsch, E., Undorf-Spahn, K., Kleespies, R.G., Jehle, J.A. (2019). *Journal of Invertebrate Pathology* **160**, 76-86.
 Larem, A., Wennmann, J.T., Gueli Alletti, G., Jehle, J.A. (2019). *Journal of General Virology* **100**, 679–690.
 Larem, A., Ben-Tiba, S., Fritsch, E., Undorf-Spahn, K., Wennmann, J.T., Jehle, J.A. (2019). *Viruses* **11**, 337.