Biological and molecular characterization of Baculoviruses breaking CpGV resistance

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Codling moth (CM, Cydia pomonella (Lepidoptera)) is a serious insect pest of apples, pears and walnut. Since many years, isolates of Cydia pomonella granulovirus (CpGV) are used as effective agents to control this pest. But in 2005, the first CM larvae, resistant to the commercial used virus CpGV-M (family Baculoviridae), were found and mean-while more than 40 orchards in Europe with CpGV resistance were identified.

Further studies showed that there are three types of CpGV resistance. Type I resistance is inherited in a dominant and Z-chromosome linked way and directed against CpGV-M, whereas the type II resistance is dominant and autosomally inherited. It is directed against CpGV-M and CpGV-S. A third type has a mixed Z-chromosomal and autosomal inheritance.

There are only few CpGV isolates, such as CpGV-E2, which are able to break the different forms of resistance. Therefore, it is important, to search for other resistance breaking Baculoviruses. Recently, a novel Alphabaculovirus CrpeSNPV, which was isolated from the litchi moth Cryptophlebia peltastica, had been shown to be effective against CM larvae.

To test the efficacy of CrpeSNPV against resistant CM strains, full range bioassays were performed and the LC50 value was calculated. In addition, time mortality response was recorded to compare the speed of killing between CrpeSNPV and other CpGV isolates.

Furthermore, experiments with the C. pomonella cell line Cp14R were conducted to obtain more information about the in vitro replication capacity of this new Alphabaculovirus.