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Are Apis mellifera Filamentous Virus (AmFV) and Lake Sinai Virus (LSV) emerging viruses in Uruguay? A retrospective survey

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The honey bee is a key pollinator in natural and agricultural ecosystems. Unfortunately, around the world, beekeepers face high colony losses due to several factors, including infection with RNA viruses. Many honey bee viruses remain in a subclinical state and are often considered emergent, although they may have been present for a long time. However, in combination with other factors, such as poor nutrition, high Varroa destructor infestations, or the presence of bacterial infections, the honey bee viruses can significantly contribute to honey bee colony losses. Using next-generation sequencing, our group studied the viromes of V. destructor-resistant and susceptible colonies and detected the presence of Apis mellifera Filamentous Virus (AmFV) and Lake Sinai Virus (LSV) for the first time in Uruguayan apiaries.

This work aimed to detect AmFV and LSV using a cheaper molecular technique (qPCR) and perform a retrospective survey to establish whether their presence is recent or has been circulating within the population for an extended period.

We analyzed 202 samples from single honey bee colonies collected in Uruguay during three different studies: (i) 28 DNA samples from a regional study (2004–2005), (ii) 74 cDNA samples from a nationwide survey (March 2011), and (iii) 100 DNA and 93 cDNA samples from another nationwide survey (March–June 2021).

Our results show that AmFV and LSV are currently widespread across the country and have been present at least since 2004 and 2011, respectively. The detection of AmFV revealed its wide distribution across the country and a national prevalence of 82 ± 14%. Similarly, the qPCR detection of LSV in the samples revealed a prevalence that has increased between 2011 and 2021 from 37 ± 18% in 2011 to 99 ± 4% in 2021.

Although no cure exists for viral infections in honey bees, early detection and molecular surveillance are essential for monitoring disease dynamics and implementing effective control measures to support beekeeping sustainability.