

Presence of different-origin Israeli acute paralysis virus not related with Colony collapse disorder in Spanish honey bees

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Depopulation and collapse of honey bee colonies continue being one of the most concerning challenges in worldwide apiculture and agriculture, since honey bees are the main pollinator of crops in USA and Europe. Since the appearance of this multifactorial phenomenon known as Colony Collapse Disorder (CCD) many possible causes have been evaluated, including viruses such as Israeli acute paralysis virus (IAPV). IAPV is a Dicistrovirus which was first described in 2004 affecting Israel colonies with heavy losses and whose importance derives from its association with CCD in the USA in 2007. However, this association has not been confirmed in other countries. The aim of this study is to assess the possible association between IAPV presence and CCD and to describe the origin of IAPV in Spain, the first honey producer in the EU. We sampled three important Spanish regions due to honey production (Valencia and Andalucía) and ecological relevance and situation (Navarra). An epidemiological survey was conducted to collect handling and sanitary data. Samples were analyzed for IAPV presence by RT-PCR. Positive IAPV samples were sequenced and a phylogenetic analysis was carried out using MEGA4®. In terms of results, absence of CCD in IAPV positive colonies dismisses possible associations between IAPV and CCD in Spain. Moreover, phylogenetic analysis showed two main lineages which suggest at least two differentiated origins of IAPV in this country. Navarra and Andalucía isolates were similar mainly to French isolates, which could be explained by proximity between regions, whereas the Valencia isolate was similar mainly to USA isolates, which is possibly explained by commercial trades. As conclusions, this study has confirmed the unlikely association of IAPV with CCD and the phylogenetic relationships of Spanish IAPV with specimens from other countries, which could serve to implement surveillance measures in the future.