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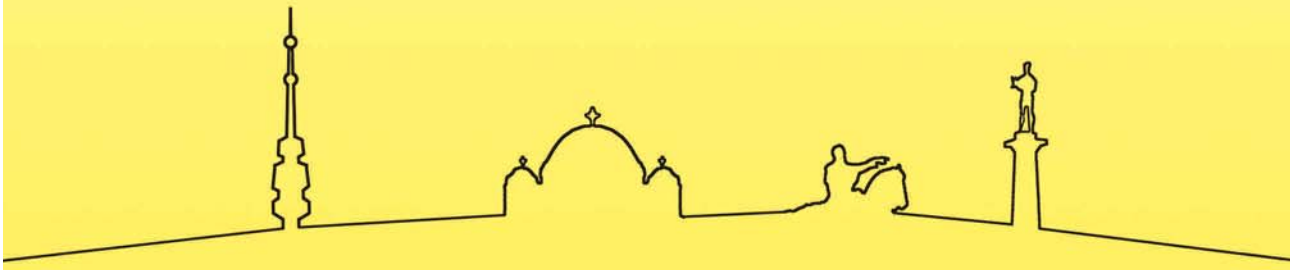

SPATIO-TEMPORAL PATTERNS OF NOSEMA CERANAE IN THE AZORES ARCHIPELAGO

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Nosema ceranae is a highly prevalent pathogen of *Apis mellifera*, which is distributed worldwide. However, there may still exist geographically isolated areas that remain free of this pathogen. While Nosema spp. spores have been identified in samples from the Azores archipelago since early 2000's, whether those spores matched *N. apis* or *N. ceranae* was unknown until this study. To address this question, we used molecular tools (multiplex PCR and real-time qPCR) to scrutinize 474 colonies sampled from eight islands in 2014/2015 and 91 from four islands in 2020. The findings revealed that *N. ceranae* was not only present but also the dominant species in the Azores. In 2014/2015, *N. apis* was rare and *N. ceranae* prevalence varied between 2.7% in São Jorge and 50.7% in Pico. In 2020, *N. ceranae* prevalence increased significantly ($p < 0.001$) in Terceira and São Jorge, which also showed higher infection levels. The spatio-temporal patterns suggest that *N. ceranae* colonised the archipelago recently, and it rapidly spread across other islands, where at least two independent introductions might have occurred. Flores and Santa Maria have escaped the *N. ceranae* invasion, and it is remarkable that Santa Maria is also free of *Varroa destructor,* which makes it one of the last places in Europe where the honey bee remains naive to these two major biotic stressors.

Keywords: *Nosema ceranae*, prevalence, Azorean honey bees