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ABSTRACT BOOK

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Poster 8

Distribution of Alleles Linked to Pyrethroid and Amitraz Resistance in *Varroa destructor* across Portugal

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Varroa destructor, an ectoparasitic mite of honey bees (*Apis mellifera*), is a significant threat to apiculture by causing varroosis and transmitting dangerous viruses such as the deformed wings virus. This mite can be controlled by the use of synthetic or organic acaricides. Currently, in Portugal, two classes of synthetic compounds are used: pyrethroids (fluvalinate and flumethrin), and formamidines (amitraz). However, excessive and repeated use of acaricides has led to resistance in mite populations. Resistance to pyrethroids is primarily associated with mutations in the voltage-gated sodium channel gene, and involves an amino acid change at position 925, where a leucine (L) is found in the wild type. At this position, three alleles have been described that confer Varroa resistance to pyrethroids, where leucine is replaced by valine (L925V), isoleucine (L925I), or methionine (L925M). A novel mutation at position 918 was described in a population in the Valencian Community in Spain, where the amino acid methionine, generally found at position 918, was replaced by leucine (M918L). For amitraz, resistance is linked to mutations in the Octβ2R gene, involving a substitution of asparagine by serine at position 87 (N87S), found in France, and a substitution of tyrosine by histidine at position 215 (Y215H), found in the USA. However, the distribution of these resistance-associated alleles remains unexplored in Portugal. To address this gap, we sampled Varroa mites from honey bee colonies from different locations in Portugal, and used a PCR assay with mutation-specific primers, followed by Sanger sequencing of the amplicons. The results confirmed pyrethroid resistance alleles at positions 925 and 918 in the Portuguese populations. In contrast, amitraz-resistance alleles remained undetected, although this result should be interpreted with caution as the sample size was reduced. These findings represent a step forward for understanding the status of Varroa resistance in Portugal, providing baseline data for the development of more effective, region-specific management strategies. Further research with larger sample sizes is essential to confirm these preliminary observations.

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