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# ABSTRACT BOOK

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**Distribution of pyrethroid and amitraz resistance in *Varroa destructor* mites from honey bee (*Apis mellifera*) colonies in Portugal**

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Honey bees (*Apis mellifera*) are widely used for pollination and honey production worldwide. However, they face a serious threat from the ectoparasitic mite *Varroa destructor*. This parasite causes varroosis and transmits multiple viruses, such as the Deformed wing virus (DWV), compromising the health and survival of colonies. While there are many acaricides commercially available to treat colonies against varroa, the recurrent use of certain molecules is leading to the development of varroa resistance. In Portugal, two classes of synthetic compounds are currently used: pyrethroids (fluvalinate and flumethrin) and formamidines (amitraz). However, the excessive and repeated use of acaricides has led to the development of resistance in mite populations. Pyrethroid resistance is linked to mutations in the Voltage-Gated Sodium Channel (VGSC) gene, with amino acid substitutions, at position 925 and 918. Amitraz resistance is associated with mutations in the Octopamine-like  $\beta$ -adrenergic receptor (Oct $\beta$ 2R). The amino acid changes include asparagine (N) to serine (S) at position 87 (N87S), observed in France; tyrosine (Y) to histidine (H) at position 215 (Y215H), in the USA; phenylalanine (F) to leucine (L) at position 290 (F290L), in Spain; and tyrosine (Y) to phenylalanine (F) at position 337 (Y337F), in Turkey. The distribution of resistance alleles has not yet been explored in Portugal. To fill this data gap, *Varroa* mites from honey bee colonies across various regions of the country were analyzed through DNA extraction, PCR with specific primers, and Sanger sequencing. The results confirmed the of widespread distribution of resistance alleles to pyrethroids at positions 925 and 918, like those observed in Spain. In contrast, preliminary results did not detect any amitraz resistance alleles, although the small sample size warrants caution in interpretation. This study represents an important step in understanding *V. destructor* resistance to chemical treatments in Portugal, providing essential data for monitoring acaricide resistance and supporting the development of more effective management strategies to help beekeepers better protect their colonies.

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