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The susceptibility of *Varroa destructor* against oxalic acid: a study case

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Abstract

Varroa destructor Anderson et Trueman is an ectoparasitic mite of the honey bee *Apis mellifera* L. and it must be controlled in managed bee colonies to maintain colony health. Taking into account that these mites are now resistant to synthetic acaricides worldwide, oxalic acid was suggested as an alternative for *Varroa* control. Oxalic acid is one of the most common natural miticides used against varroosis by spraying and sublimation administration techniques. It is a natural constituent of honey, very active against the *Varroa* mite, safe to use for beekeepers, and has no residue problems. Nevertheless, some authors have predicted that the risk of developing resistance to oxalic acid in mites is high. The objective of this research was to assess the susceptibility to oxalic acid of a *V. destructor* population belonging to a commercial apiary where 64 consecutive control treatments with this acid were performed. Bioassays to assess the oxalic acid susceptibility were performed on two mite populations: (1) a 'focal' population consisting of mites previously exposed to oxalic acid treatments, and (2) a 'naïve' population that was never exposed to this acid, which allows setting a reference in the absence of historical data on our 'focal' mites. The results reported here suggest that the *Varroa* population exposed during 8 successive years to oxalic acid treatments remains susceptible to this acid.

Key words: *Varroa destructor*, susceptibility, oxalic acid, honey bee.

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