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Abstract

Isolation of Fungal Metabolites as a Therapeutical Alternative to Control *Nosema ceranae* (Microspora, Nosematidae) in *Apis mellifera* (Hymenoptera, Apidae) †

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A growing body of evidence suggests that *Nosema ceranae* is one of the causes of the increased honeybee mortality reported in recent years. However, few drugs are known to be active against this parasite, which can generate adverse effects at individual and colony level. The main objective of this study was to investigate, under laboratory conditions, the possible antiparasitic effect of the metabolites extracted from one fungal specie of the genus Trichoderma. Isolated fractions or complete secretome (fresh or lyophilized) of the fungal strain were extracted. We carried out *in vitro* test to evaluate the direct effect of the secretome or the compounds extracted on the viability of *N. ceranae* spores by means of using microscopy techniques with fluorescent probes. The findings show that the fresh complete secretome and one isolated fraction are not toxic for bees, but also have promising bioactivity against the pathogen. Both treatments presented a significant inactivation of spores (68.2 % and 92.1 % respectively) after a 24-hour exposition period. In addition, the antiparasitic activity of the treatments after lyophilisation also showed a significant reduction in the spore viability (36.3 % and 46.6 % respectively). The experimental data suggests that the fraction tested may diminish the viability of spores present in infected bees without altering honeybee survival. Results of the research represent a further step towards the development of a possible therapeutic alternative for the control of this disease.

Keywords: Honeybees; nosemosis; therapeutic products; beekeeping

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