Bees in and for the future

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Assessment of the Effects of the Fungicide Piraclostrobin on Immature Stages of *Melipona quadrifasciata* Bees: An Ecotoxicological Study

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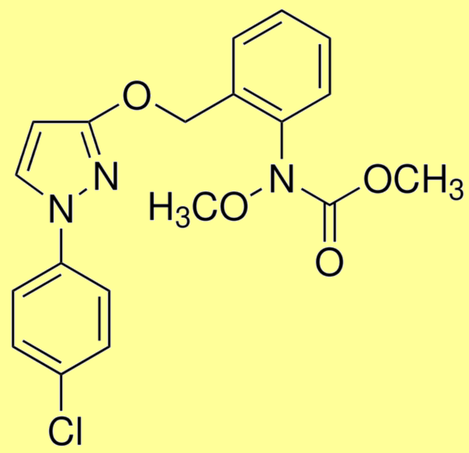
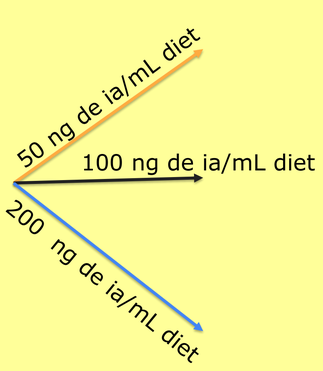
INTRODUCTION

Bees stand out for their ecosystem service of pollination, which contributes to the maintenance of biodiversity and the enhancement of productivity and quality of agricultural crops. In this agricultural scenario, the use of pesticides is one of the factors that can contribute to the decline of pollinators; thus, bees are considered excellent models for ecotoxicological analyses. In this study, we explored the potential effects of the fungicide Piraclostrobin on immature stages of the bee species *Melipona quadrifasciata*.





METHODOLOGY

Residual concentrations of the fungicide, corresponding to those found in pollen, were employed to simulate realistic environmental exposures (50, 100, and 200 ng of active ingredient/mL of diet). Larvae were collected from colonies maintained under controlled conditions at Embrapa Meio Ambiente, Jaguariúna - SP, and reared according to established protocols for the related species Melipona scutellaris. Daily observations were conducted until the emergence phase, followed by survival rate assessment.

RESULTS

The results did not reveal significant differences between the treatment groups and the control (χ^2 = 4.2, D.F. = 4, p-value = 0.4). Furthermore, we will examine potential morphological alterations in the intestines of emerging bees after exposure to the fungicide; these are the next steps of this study. This investigation contributes to our understanding of the ecotoxicological effects of Piraclostrobin on pollinating bees, with important implications for biodiversity conservation and the sustainability of agricultural ecosystems.