

Oral Communication 12

## Bioinsecticide SPINTOR®: detrimental effects on earthworms *Eisenia fetida* at different levels of biological organization

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### Abstract

**Background:** The increasing interest in sustainable agricultural practices led to the use of biopesticides instead of synthetic ones [1]. SPINTOR® (SPI) is a commercialized bioinsecticide that employs spinosad as its active ingredient, a natural by-product obtained from the *Saccharopolyspora spinosa* fermentation [2]. Although effective in controlling several pests, SPI also can present inadvertent effects on non-target organisms in different environmental compartments [3]. *Eisenia fetida* is an example of soil fauna that can be affected and is frequently used as model organisms in soil ecotoxicology research. **Objective:** The objective of this study is to evaluate the potential ecotoxicity of SPINTOR® on several endpoints of *E. fetida*. **Methods:** The effect of SPI on the reproduction [4] and avoidance behavior [5] of *E. fetida* was assessed following standard protocols. A short-term exposure of 48 h was also carried out. The experimental design consisted in eight treatments of a natural soil spiked with different concentrations of SPI (0.00 up to 1.49 mg of active ingredient/kg of soil<sub>dw</sub>). The concentrations were determined based on the application dose and environmental relevance. The *E. fetida* adults from the short-term exposure (48 h) and the reproduction assay (28 d) were further processed to assess several biochemical parameters, including biomarkers related to oxidative stress, energy reserves, neurotransmission, and genotoxic effects through the comet assay. **Results:** Initial findings indicate that chronic exposure of *E. fetida* causes alterations to its energy-related metabolic pathways and antioxidant defenses. And although no effects were observed in the number of juveniles produced at the end of the assay, *E. fetida* show a tendency to avoid the contaminated soil in the highest concentrations, as well as significant DNA damage was observed after 48 h of exposure. **Conclusions:** It can be inferred that SPINTOR® has a negative impact on the health and wellness of *E. fetida*, potentially impairing their crucial roles in terrestrial ecosystems.

**Keywords:** Oligochaeta; reproductive activity; genotoxicity; metabolic and physiological disorders

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