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Effect of ketamine on the avoidance behavior and reproduction of the oligochaete Eisenia Fetida – preliminary data

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Resumo

Introduction: The use of ketamine for therapeutic purposes has been growing, however recreative use as hallucinogen has raised concern both in terms of public and environmental health [1]. Ketamine and its metabolites have been detected in effluents due to the inefficiency of conventional treatments applied in wastewater treatment plants [2,3]. Since part of these effluents can be used as water for crop irrigation operations [4], it is important to understand the effects of potential contaminants like ketamine on soil organisms such as earthworms. **Objectives:** The main objective of this work is to evaluate ketamine effects in *Eisenia fetida* as an ecologically relevant model species representative of earthworms, focusing on behavior and reproduction endpoints. **Material and Methods:** Thus, for this purpose, a gradient of increasing concentrations of ketamine (0, 25, 250 and 2500 µg/kg) was used to evaluate the effects of this substance in avoidance behavior and reproduction of *Eisenia fetida* following the methods described in the standard guidelines ISO 17512-1 and OECD nº 222 through laboratory avoidance and reproduction tests, respectively. **Results:** Data indicated no significant differences *(p>0.05)* between ketamine concentrations and the control. In average, ketamine promoted an escape and a decrease of juveniles in the order of 11% and 26%, respectively, compared to the control group, but further tests would be needed to check the consistence of these tendences. **Conclusion:** These results seem to indicate that the concentrations studied do not promote negative effects either on avoidance behavior and reproduction. Nevertheless, additional tests using higher concentrations should be performed, in order to allow the estimation of the EC50 and LC50 values for *E. fetida*, and to evaluate the effects of ketamine in other soil organisms, representative of other taxonomic groups (e.g collembolans and mites).

Keywords: psychoactive drugs; ketamine; *Eisenia fetida*; avoidance behavior; reproduction.

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