

Poster 37

Changes on swimming behavior induced by 3,4-methylenedioxypropylamphetamine (MDPV) enantiomers on *Daphnia magna*

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Abstract

Background: Synthetic cathinones (SC) are a group of novel illicit psychotropic substances that have been found in the aquatic environment at low concentrations [1] and nonetheless they can impact aquatic invertebrates [2]. SC can pose unwanted diverse adverse effects such as behavioral toxicity to non-target organisms [3]. The 3,4-methylenedioxypropylamphetamine (MDPV) is a chiral SC with psychotropic properties similar to methamphetamine and is traded as “bath salts” [4]. MDPV may be found in distinct forms, racemate or its enantiomers, that may exhibit different biological activities [2, 5]. Nevertheless, MDPV enantioselectivity continued to be ignored as well as its impact on freshwater aquatic organisms, including invertebrates. **Objective:** This work aimed to assess the potential adverse effects of (*R*)-MDPV and (*S*)-MDPV on the swimming behavior of *Daphnia magna*. **Methods:** For that, neonates (< 24 hours) were exposed to 0.1 and 1.0 µg L⁻¹ of both MDPV enantiomers for 5 days (5 replicates with 20 organisms each). After the end of exposure, 6 organisms of each replicate were randomly collected, placed into a 6-well plate (with ≈ 5 mL of the respective exposure medium) and video recorded for 1 minute. Parameters such as swimming speed, total distance travelled, and active time were evaluated using TheRealFish-Tracker program. **Results:** A significant increase in swimming speed was observed for the organisms exposed only to (*S*)-MDPV. On the contrary, an increase in active time was found in the organisms exposed to (*R*)-MDPV. No changes were detected for the total distance travelled for both enantiomers. **Conclusions:** This study showed that MDPV can interfere with the swimming behavior pattern of daphnia and that effects are enantioselective. However, for a better understanding of the enantioselective toxicity of MDPV on the fitness of daphnia, other parameters should be included (i.e., morphophysiological, reproductive and biochemical).

Keywords: chiral psychotropic drugs; MDPV; enantioselectivity; aquatic pollution; emergent contaminants

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