

Endocrine Disruptors Effects on the 20-Hydroxyecdysone Concentration and the Vitellogenin Gene Expression in Gammarus sp.

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Abstract : Endocrine disruptors (EDCs) are well known to disrupt the development and the reproduction of exposed organisms. Although this point has been studied in vertebrate models, the limited knowledge of the endocrine system of invertebrates makes the evaluation of EDCs effects difficult. However, invertebrates represent the major part of aquatic ecosystems, such as amphipods Gammaridea, which are crucial for their functioning (e.g., litter degradation, food resource). Moreover, gammarids are hosts of parasites such as vertically-transmitted microsporidia (microsporidia VT), which could be confounding factors in assessment of EDC effects. Indeed, some microsporidia VT could have endocrine effects by their own present in the host since it was observed for example, a feminization of juvenile males, which become phenotypic females. This work evaluated the impact of ethinylestradiol (EE₂, estrogenic), cyproterone acetate (CPA, anti-androgenic), 4-hydroxytamoxifen (4HT, anti-estrogenic) and 17 α -methyltestosterone (17MT - androgenic), on the 20-hydroxyecdysone concentration (i.e. 20HE - molt process) and the vitellogenin gene expression (i.e. reproduction) in the freshwater amphipod *Gammarus pulex*, after a 96h laboratory exposure. In addition, the presence of microsporidia VT was verified in order to analyze the effect of this confounding factor. Results of this study shown that, although endocrine systems of invertebrates and vertebrates are different, EDCs proved in vertebrates could also affect biological functions hormonally controlled in invertebrates. Indeed, the molt process of crustaceans was disrupted in the first stage (i.e. 20-HE concentration) and therefore, could affect, at the long term, the population dynamic. In addition, it was observed that *G. pulex* was differently impacted according to the gender and parasitism, which underline the importance to take into account these confounding factors to better evaluate the EDCs impact on invertebrate populations.

Keywords : endocrine disruption, gammarus sp., molt, parasitism

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