

Effects of Environmentally Relevant Concentrations of Bisphenol A on the Fathead Minnow

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Bisphenol A (BPA) is a wide-spread environmental contaminant of concern due, in part, to possible effects on the vertebrate hypothalamic-pituitary-gonadal (HPG) axis, including activation of the estrogen receptor (ER). There is a reasonable amount of toxicological information for aquatic species exposed to BPA, but much of these data have been generated at relatively high test concentrations. The objective of this study was to determine the effects of BPA on ex vivo sex steroid (testosterone [T], estradiol [E2]) production, plasma concentrations of T, E2, and vitellogenin (VTG), and VTG gene expression. Adult fathead minnows (*Pimephales promelas*) were exposed for four days to water concentrations of 0.01, 0.1, 1, 10 and 100 µg BPA/L, a range that encompasses concentrations observed in the environment. Water concentrations of BPA were measured daily without sample concentration using liquid chromatography along with mass spectrometry and fluorescence detection. The detection limit of the chemical analysis method was 0.009 µg BPA/L. Exposure to water concentrations as low as 0.1 µg BPA/L significantly reduced ex vivo E2 production by ovary tissue collected from exposed female fish. Exposure to BPA also caused significant induction of VTG in males, a classic marker of exposure to estrogenic chemicals, albeit at a concentration (100 µg/L) 1000 times greater than that which significantly impacted ovarian E2 production. Overall these studies suggest that BPA can influence HPG axis function in fish at environmentally-relevant concentrations. *This abstract does not necessarily reflect EPA policy.*