

Biological responses of marine flatfish exposed to municipal wastewater effluent

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ABSTRACT

There is increasing concern over the presence of pharmaceutical compounds, personal care products, and other chemicals collectively known as contaminants of emerging concern (CECs) in municipal effluents, yet knowledge of potential environmental impacts related to these compounds is still limited. The present study used laboratory exposures to examine estrogenic, androgenic, and thyroid-related endocrine responses in marine hornyhead turbot (*Pleuronichthys verticalis*) exposed to CECs from municipal effluents with 2 degrees of treatment. Fish were exposed for 14 d to environmentally realistic concentrations of effluent (0.5%) and to a higher concentration (5%) to investigate dose responses. Plasma concentrations of estradiol (E2), vitellogenin (VTG), 11-ketotestosterone, and thyroxine were measured to assess endocrine responses. Contaminants of emerging concern were analyzed to characterize the effluents. Diverse types of effluent CECs were detected. Statistically significant responses were not observed in fish exposed to environmentally realistic concentrations of effluent. Elevated plasma E2 concentrations were observed in males exposed to ammonia concentration similar to those found in effluents. However, exposure to ammonia did not induce VTG production in male fish. The results of the present study highlight the importance of conducting research with sentinel organisms in laboratory studies to understand the environmental significance of the presence of CECs in aquatic systems.

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