

**FROM INDIVIDUAL COMPOUNDS TO COMPLEX MIXES:  
IMPACTS OF CONTAMINANT EXPOSURE ON DEVELOPMENT AND REPRODUCTIVE BEHAVIOR**

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**ABSTRACT:** Wastewater effluent world-wide has demonstrated endocrine disrupting actions in both in vitro and in vivo systems. The physiological outcome of exposure to effluent on wildlife species includes development of gonadal abnormalities, changes in sexually dimorphic characteristics, and outright sex reversal. Less is understood about how these compounds impact behavior. Our research using amphibian model systems demonstrates that a common pesticide, endosulfan disrupts pheromone production and detection, as well as reproductive behavior, and exposure to 4-tert-octylphenol, a common wastewater contaminant, disrupts expression of a key gene involved in gonadal differentiation, steroidogenic factor-1. Last, bullfrog (*Rana catesbeiana*) tadpoles found in a local riparian area receiving mostly wastewater effluent have a female-skewed sex ratio compared to animals from a reference site. These results suggest that in vivo exposure to emerging contaminants may not only impact gonadal development, but may also disrupt key aspects of reproductive physiology, including behavior and may lead to reduction in fitness. Throughout the world, and especially in arid regions such as the United States Southwest, effluent is released into the environment. As clean water resources diminish, use of wastewater effluent as reclaimed water for agriculture, recreation and aquifer recharge has become critical. Therefore, it is important to define the impact of chemical mixes on development and adult function. Understanding the potential for physiological disruption by exposure to effluent is both a wildlife and human health imperative. Such research will determine the necessity for utilizing limited and competing public financial resources to develop and implement better water treatment strategies.

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