

Altered amphibian secondary sex characteristics following exposure to model endocrine disruptors

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The formation of the secondary sex characteristics, oviducts and nuptial pads, are under the control of steroid hormones in frogs and as such are potential targets for endocrine-disrupting compounds. Oviducts are large, convoluted tubules derived from the Mullerian ducts in which oocytes undergo final maturation during breeding. Nuptial pads form under the forelimbs of male frogs and are characterized by the presence of raised, darkly pigmented epidermal spikes and dermal breeding glands. Normal expression of oviducts and nuptial pads are under the regulation of estradiol and testosterone respectively, develop during juvenile maturation, and are exclusively found in only one sex. In order to determine the susceptibility of these tissues to endocrine disruption we exposed juvenile tropical clawed frogs, *Xenopus tropicalis*, to the model endocrine disruptors ethynylestradiol and trenbolone during juvenile development and assessed the development of oviducts and nuptial pads in both sexes. Dietary exposure was accomplished by coating food pellets with chemical and then feeding once per day for 4 or 12 weeks. Following dose-response studies, additional time course studies were performed using one dose. Ethynylestradiol exposure resulted in precocious development of oviducts in females, but did not result in oviduct development in males. Vitellogenin was induced in both sexes following ethynylestradiol exposure and was more sensitive than oviduct development. Nuptial pad expression increased in males exposed to trenbolone. Exposure to trenbolone in females also resulted in the development of nuptial pads. Results from these experiments demonstrate that development of these secondary sex characteristics is susceptible to xenobiotic perturbation and may be useful for development of amphibian screening assays for endocrine disruptors. This abstract does not necessarily reflect USEPA policy.