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## Sterility in Frogs Caused by Environmental Pharmaceutical Progestogens, Study Finds

*Frogs appear to be very sensitive to progestogens, a kind of pharmaceutical that is released into the environment. Female tadpoles that swim in water containing a specific progestogen, levonorgestrel, are subject to abnormal ovarian and oviduct development, resulting in adult sterility. This is shown by a new study conducted at Uppsala University and published in the journal Aquatic Toxicology.*

Many of the medicines that people consume are released into the environment via sewage systems. Progestogens are hormone preparations used in contraceptives, cancer treatment and hormone replacement therapy for menopausal discomfort. Different kinds of progestogens have been identified in waterways in a number of countries. Associate Professor Cecilia Berg and Doctoral Student Moa Kvarnryd at the Department of Environmental Toxicology at Uppsala University have shown that levonorgestrel can cause sterility in female frogs at concentrations not much higher than those measured in the environment. The research group is part of MistraPharma, one of the world's largest research networks focusing on Pharmaceuticals and the Environment.

"The findings represent important initial evidence that an environmental progestogen can adversely affect frogs," says Cecilia Berg.

Female tadpoles that swam in water containing low concentrations of levonorgestrel exhibited a greater proportion of immature ovarian egg cells and lacked oviducts, entailing sterility. The African clawed frog (*Xenopus tropicalis*) served as the model organism. It is during the tadpole stage that development of frog reproductive organs begins. The process is governed by the hormone system. The findings underscore the importance of studying how pharmaceuticals affect animals in our environment, which is one objective of MistraPharma.

"Our findings show that pharmaceuticals other than estrogen can cause permanent damage to aquatic animals exposed during early life stages," says Cecilia Berg.

**Source:** Moa Kvarnryd, Roman Grabic, Ingvar Brandt, Cecilia Berg. Early life progestin exposure causes arrested oocyte development, oviductal agenesis and sterility in adult *Xenopus tropicalis* frogs. *Aquatic Toxicology*, 2011; DOI: 10.1016/j.aquatox.2011.02.003