

**Adverse effect of 17 $\beta$ -estradiol and di-2-ethylhexyl phthalate on the reproduction of juvenile common carps (*Cyprinus carpio*)**

J. W. Seo<sup>1\*</sup>, K. S. Park<sup>2</sup>, W. K. Moon<sup>2</sup>, and S. K. Lee<sup>1</sup>

<sup>1</sup>Environmental Toxicology Research Team, Korea Institute of Toxicology, 100 Jang-dong, Yusong-gu, Taejon 305-306, <sup>2</sup>Fish Ecology Laboratory, Department of Biology, Chungnam National University, Gung-dong, Yusong-gu, Taejon 305-764.

Environmental estrogens are natural or synthetic substances present in the aquatic environment, especially in effluent from sewage treatment. However, the adverse effects of these estrogenic substances on fish reproduction are unknown. DEHP is the most common phthalate, which is used as a plasticizer in polyvinylchloride (PVC), and it is widespread in the environment and has been found in aquatic organisms and sediments. Therefore, juvenile common carps (*Cyprinus carpio*) were exposed to nominal concentrations of 17 $\beta$ -estradiol (E<sub>2</sub>) (0.5, 5, 50  $\mu$ g/L) and di-2-ethylhexyl phthalate (DEHP) (10, 100, 500  $\mu$ g/L) for 21 days, to determine the adverse reproductive effects of these compounds on plasma vitellogenin (VTG) induction, sex steroid level, and gonad weight. Electrophoresis (SDS-PAGE) revealed that much of VTG was induced in fish exposed to 5 and 50 E<sub>2</sub>  $\mu$ g/L, but none of DEHP exposure showed induction. Analysis of sex steroid levels in some fish revealed that testosterone (T) was detected in both male and female fish of the control and DEHP exposures, but none of fish exposed to E<sub>2</sub> concentrations had detectable testosterone level. On the other hand, E<sub>2</sub> exposure induced 17 $\beta$ -estradiol in plasma of male fish, but there was no induction of 17 $\beta$ -estradiol in plasma of male fish exposed to DEHP. Comparison of gonadosomatic index (GSI) revealed that maximal E<sub>2</sub> exposure inhibited ovarian growth, but maximal DEHP exposure stimulated testicular growth. The results indicated that those comparisons can be a useful bioindicator for determining adverse reproductive effects of endocrine disrupting chemicals.