

Comparison of vitellogenin response in Rockfish induced by PCB153 and 4-Nonylphenol

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Several environmental chemicals are known to affect sex steroid production and vitellogenesis through agonistic or antagonistic pathway. In this study, we examined the estrogenic effect of 2,2',4,4',5,5'-hexachlorobiphenyl (PCB 153) and 4-nonylphenol on the rockfish, *Sebastes schlegeli*, which is commercially an important marine species in the coastal waters of Korea. A cDNA library and cloned 620 bases length encoding a partial VTG mRNA of the rockfish (rVTG) was constructed. rVTG mRNA transcript of approximately 4.0 kilo bases from hepatic tissue was extracted for the northern blot analysis. Effects of PCB 153 and 4-nonylphenol on rVTG mRNA expression *in vivo* with both male and female juvenile rockfish were examined using the northern blot analysis. The level of rVTG mRNA expression increased only in the female rockfish injected with PCB 153 after 48 h of exposure. Concentrations of plasma rVTG in the female injected with PCB 153 increased at 72 h. On the other hand, no rVTG was detected in the male rockfish injected with the same dosage. Plasma concentrations of testosterone in the female were not significantly different from the control group. However, plasma estradiol-17 β (E₂) concentrations of the female increased at 12 hours and 24 hours after injection. These results imply that PCB 153 may induce VTG production in the female rockfish through disruption of the aromatization process and then increasing E₂ levels, indirectly. The level of rVTG mRNA expression was increased at 48 h after injection with 4-NP of 10 mg/kg b.w. in both male and female rockfish. The level of rVTG mRNA expression was increased at 24 h after injection in male rockfish injected with 4-NP of 25 mg/kg b.w., whereas the level of rVTG mRNA expression was increased at 12 h after injection in female injected with same dosage. Concentrations of plasma rVTG in female and male injected with 4-NP of 10 mg/kg b.w. and 25 mg/kg b.w. were increased at 72 h after injection. Plasma concentrations of T and E₂ in female and male injected with 4-NP were not significantly different between two dosages of 10 mg/kg b.w. and 25 mg/kg b.w. These results suggest that 4-NP may disrupt the reproductive system of immature rockfish by acting directly on vitellogenesis. Immature females injected with 4-NP were more sensitive than immature males.