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The Effect of Acute Toxicity and Thyroid Hormone Treatments on Hormonal Changes during Embryogenesis of Acipenser persicus

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Abstract : Production of high quality fish eggs with reasonable hatching rate makes a success in aquaculture industries. It is influenced by the environmental stimulators and inhibitors. Diazinon is a widely-used pesticide in Golestan province (Southern Caspian Sea, North of Iran) which is washed to the aquatic environment (3 mg/L in the river). It is little known about the effect of this pesticide on the embryogenesis of sturgeon fish, the valuable species of the Caspian Sea. Hormonal content of the egg is an important factor to guaranty the successful passes of embryonic stages. In this study, the fate of Persian sturgeon embryo to 24, 48, 72, and 96-hours exposure of diazinon (LC_{50} dose) was tested. Also, the effect of thyroid hormones (T3 and T4) on these embryos was tested concurrently or separately with diazinon LC_{50} dose. Fertilized eggs are exposed to T3 (low dose: 1 ng/ml, high dose: 10 ng/ml), T4 (low dose: 1 ng/ml, high dose: 10 ng/ml). Six eggs were randomly selected from each treatment (with three replicates) in five developmental stages (two cell- division, neural, heart present, heart beaten, and hatched larvae). The possibility of changing T3, T4, and cortisol contents of the embryos were determined in all treated groups and in every mentioned embryonic stage. The hatching rate in treated groups was assayed at the end of the embryogenesis to clarify the effect of thyroid hormones and diazinon. The results indicated significant differences in thyroid hormone contents, but no significant differences were recognized in cortisol levels at various early life stages of embryos. There was also significant difference in thyroid hormones in (T3, T4) + diazinon treated embryos (P□0.05), while no significant difference between control and treatments in cortisol levels was observed. The highest hatching rate was recorded in HT3 treatment, while the lowest hatching rate was recorded for diazinon LC_{50} treatment. The result confirmed that Persian sturgeon embryo is less sensitive to diazinon compared to teleost embryos, and thyroid hormones may increase hatching rate even in the presence of diazinon.

Keywords : Persian sturgeon, diazinon, thyroid hormones, cortisol, embryo
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