

عنوان مقاله:

Research Article: Alterations in Hematological indices, histopathology and pF50 gene expression in stellate sturgeon (Acipenser stellatus Pallas, ۱۸۱۱) fingerlings exposed to different salinities levels and ammonia

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خلاصه مقاله:

This study aimed to combined effects of salinity and ammonia on physiological responses, liver enzymes, pF50 gene expression, and gill and liver Histopathological of juvenile stellate sturgeon (Acipenser stellatus). To this end, a two-stage experiment was carried out. At the first stage, the lethal concentration (LC50 96h) of ammonia in salinities 0 ppt: ۷.۴۲ mgL-1, ۴ppt: ۸.۲۴ mgL-1, ۸ppt: ۹.۶۰ mgL-1, and ۱۲ ppt: ۱۰.۲۲mgL-1 to juveniles of stellate sturgons was determined. At the second stage, ۳۶۰ juveniles of stellate sturgeons (with a mean weight and length of ۱۵.۲۳±۲.۱۷ g and ۱۷±۱.۹۶ cm) were exposed to half (50%) median lethal concentration (LC50-96h) (۳.۷۱, ۴.۱۲, ۴.۸۰, and ۵.۱۱ mgL-1) under the same salinities for ۴ days (۸ treatments with ۳ replicates a piece). Maximum blood indices (CBC) were observed in combined treatments with salinity and ammonia ($P \leq 0.05$). Blood stress indicators (Cortisol, Glucose, Lactate) and blood serum immunity indices (IgM, Lysozyme, Total Immunoglobulin) decreased and increased significantly with increasing salinity and ammonia in combination treatments, respectively ($P \leq 0.05$). The activity of GPX and SOD antioxidant enzymes increased in combined salinity and ammonia treatments but CAT decreased ($P \leq 0.05$). liver enzyme levels of ALT and AST in the blood serum of juvenile of stellate sturgeons increased in combined salinity and ammonia treatments ($P \leq 0.05$). But a significant decrease in the levels of ALP and LDH enzymes was observed ($P \leq 0.05$). The highest gill damage was observed in salinity of ۱۲ p p t and also combined treatment of salinity of ۱۲ p p t with ammonia. The most widely noticed symptoms included, Necrosis of Secondary lamellae, Disruption of cartilaginous core. Destruction of the pilar apparatus and congestion in the lamellae, Necrosis of primary lamellae and Fusion of some secondary lamellae. Liver tissue of juvenile stellate sturgeons (A. stellatus) was severely affected by high salinity alone and with ammonia. Complications such as Melanomacrophage center, Necrosis, Sinusoid and

Karyolysis were more common. The hepatic P450 gene expression increased from Treatment 5 through Treatment 8 ($p < 0.05$), as the highest gene expression was related to Treatment 8. This suggests that exposure to ammonia along with salinity stress activates the body's internal defense system. Therefore, brackish or saline water at concentrations (ammonia concentrations obtained at different salinities) proposed in this study can be used in aquaculture systems ... for the juveniles of stellate sturgeon. Moreover, Obtained concentrations of ammo

کلمات کلیدی:

Acipenser stellatus, Ammonia, Salinity, Hematological indices, Histopathological, Gene expression p450

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