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Effects of Toluene-2,4-Diamine on Red Sea Bream, *Pagrus major*: Biochemical and Histological Evaluation

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The subacute toxicity of toluene-2,4-diamine (2,4-TDA) on marine fish was investigated in laboratory toxicity tests using red sea bream, *Pagrus major*. The fish were exposed to subacute concentrations of 2,4-TDA (measured concentrations: 0.0628, 0.234 and 0.878 mg/L) during the 14-day toxicity test and the effects on growth as well as on some biochemical parameters in the plasma, gills, liver and kidney structures were studied. The body weight and body length of the red sea bream exposed to the highest concentration were lower than those of the control. This study also showed a tendency towards decreases in three hematological parameters, i.e., the number of red blood cells, hemoglobin level and hematocrit, as well as blood chemical parameters in the plasma, i.e., the levels of total cholesterol, triglyceride, total protein and albumin, of fish exposed to the high concentrations. These findings were attributable to the reduced feeding of fish exposed to this concentration. In addition, cytoplasmic changes were observed in the cells of fish exposed to the highest concentration. It is suggested that the changes were caused by the decrease in feed efficiency derived from the exposure to 2,4-TDA .