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Effects of ultraviolet (UV) radiation on crude oil toxicity in the estuarine species, *Cyprinodon variegatus*

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In 2010, the deep water Horizon Spill released massive amounts of crude oil into the Gulf of Mexico. Oil that is spilled into the ocean can travel to sensitive estuarine habitats. Estuaries provide shelter and nutrition for reproductive and juvenile life stages of many recreationally and commercially important fish and shellfish species. It is important to elucidate the effects of crude oil on the organisms within estuarine systems. However, many studies do not include the variable of UV radiation in their testing, which is known to enhance the toxicity of oil. Thus, we studied the UV-enhanced toxicity of crude oil on larval and juvenile life stages of the sheepshead minnow (*Cyprinodon variegatus*) using several exposure scenarios; larval fish in high-energy water accommodated fractions (HEWAF), larval and juvenile fish in larger tanks with a thin sheen of oil, and larval fish with oil-contaminated sediment and clean overlying water. Mortality thresholds (LC50 values) showed that UV increased oil toxicity to larval fish in the HEWAF treatments four fold. No latent effects on mortality or growth were found in fish moved to clean water and no UV. Increasing temperature increased HEWAF toxicity. In fish exposed to thin oil sheens, there was no difference in mortality between the tanks exposed to UV versus regular lighting. Oiled sediment exposure did not affect fish survival under either light condition. Results of this study will provide new insight into the various ways in which UV radiation interactions with oil pollution can affect these estuarine fishes.

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