

Poster #15

Hypoxia Suppresses Reproduction in Gulf Killifish, *Fundulus grandis*

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Anthropogenic hypoxia in estuaries is of growing global concern, therefore a measure of ecosystem health is necessary to determine the impacts of these environmental changes in our estuarine systems. We are evaluating the potential for hypoxia to reduce reproductive effort and success in the Gulf killifish, *Fundulus grandis*. Along the Gulf of Mexico, the breeding season of *F. grandis* extends from March through September, covering seasonal periods of normoxia and summer hypoxia. Our field studies in Cocodrie, Louisiana showed that male testosterone (T) was significantly lower in July at sites experiencing moderate hypoxia (~ 58% DO saturation). In April, male T was unaffected by moderate hypoxia, suggesting that a several month period of moderate hypoxia may be necessary to suppress T levels. Female T levels did not differ with hypoxia in July, but estradiol-17 β (E₂) levels were higher at the moderately hypoxic sites. Because moderately hypoxic field sites also had lower salinity, a controlled lab experiment was performed, exposing fish to hypoxia (<20% oxygen saturation) and normoxia (>80% oxygen saturation) at 15 ppt and 27°C for one month. Female E₂ and T levels were significantly reduced under hypoxic conditions, as were GSI and number of eggs spawned. In addition, females in hypoxic conditions tended to spawn fewer days during each spawning cycle. Hypoxic males tended to have lower levels of T and 11-ketotestosterone (11-KT), while GSI was significantly different. Our results indicate that hypoxia suppresses reproductive effort in *F. grandis*, suggesting that fish reduce energy allocated to reproduction in favor of other metabolic processes, and GSI is the better indicator of reproductive success.

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