The Contaminant — Associated Stress Response and its Relationship to Plasma Stress and Sex Steroid Concentrations in the Florida Gar, *Lepisosteus platyrhincus*

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Contaminants can alter the stress response. This study examined the stress response, defined by plasma cortisol concentration, and its relationship to plasma estradiol-17β and testosterone concentrations in adult gar collected from Lake Apopka, Orange Lake and Lake Woodruff NWR, Florida (USA). Fish were acutely stressed using a capture and containment field experiment. Fish were serially bled 0, 1.5, and 6 hours postcapture. Initial concentrations of all hormones in females, and cortisol and testosterone in males, were not different between sites, whereas the estradiol-17β concentrations were lower in males from the contaminated lake compared to reference males. Females from the contaminated lake exhibited higher maximal cortisol concentrations and a more rapid increase in plasma concentration than reference lake females. While the mean cortisol concentration increased with time, there was no lake effect observed in males. In general, sex steroids had an inverse relationship with plasma cortisol concentrations; concentrations of estradiol-17β and testosterone in females, and testosterone in males, decreased over time. The plasma estradiol-17β concentration did not change with time in male gar. Also, there was no difference in sex steroid concentrations observed between lakes in the females. In males, lake of origin had no effect on plasma concentration of testosterone. This study represents the first research examining the stress response in a holostean fish.