

The Effect of Body Size on Mercury Concentration of Orb-Weaving Spiders (Araneidae) from the Clear Fork and West Fork of the Trinity River

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Mercury (Hg) is a contaminant threatening all ecosystems. Inorganic Hg is released into the atmosphere from power plants and artisanal gold mines before being deposited over the landscape. Inorganic Hg deposited in the water can be converted by aquatic bacteria to methylmercury (MeHg). Methylmercury is one of the most toxic forms of Hg due to its capability of bioaccumulating within the tissues of organisms. Overexposure of methylmercury can cause damage to the nervous, genetic, and enzyme systems in the body, leading to a multitude of health complications. Evaluating the amount of Hg in an ecosystem, and thus the risk to organisms, is not straightforward. For example, the concentration of Hg in water or sediment may not be representative of aquatic organisms' exposure to Hg because not all the Hg in water or sediment is bioavailable. As a result, scientists measure Hg concentrations in sentinels, defined as: an organism that can accumulate Hg within its tissue without significant adverse effects and serve as a representation of the level of Hg present within an ecosystem. Riparian spiders consume emerging aquatic insects and are therefore sentinels of Hg contamination in aquatic ecosystems. The objective of the study was to evaluate the concentration of total Hg in orb-weaving spiders (Family Araneidae) from the Clear Fork and

West Fork of the Trinity River and determine how Hg concentration changes with spider body size. Spiders were preserved in 95% ethanol and body size was measured. Spiders were then dried and analyzed using a Direct Mercury Analyzer (DMA).