

Exposure of Nonylphenol Ethoxylates and Other Contaminants in Tree Swallows (*Tachycineta bicolor*) Breeding Near a Wastewater Treatment Plant

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Abstract

Although nonylphenol is known to have estrogenic effects in aquatic biota, little is known about the exposure of nonylphenol ethoxylates to insectivorous birds. This two-year study examined reproductive success, growth and immunological endpoints in Tree Swallows (*Tachycineta bicolor*) potentially exposed to nonylphenol and other contaminants located in sewage lagoons at a wastewater treatment plant. Tree swallows breeding next to the Iona Wastewater Treatment Plant were potentially exposed to high levels of nonylphenol ethoxylates through consumption of emergent insects breeding in the sewage lagoons. The results of the study showed significantly reduced clutch size in the population breeding at Iona Island in both years of study. Fledging success was significantly lower in the potentially contaminated population in the first year of data collection; however, no difference was detected in the second year of study. Other factors besides contaminant exposure that may influence reproductive success, such as diet composition and frequency of feeding trips, were not found to differ significantly between sites. Levels of nonylphenol ethoxylates detected in sediment, insects and tree swallow liver samples varied between the two years of study. This study reinforces the importance of multiple-year studies when carrying out wildlife toxicology research.