

Statewide Investigation of the Role of Pyrethroid Pesticides in Sediment Toxicity in California's Urban Waterways

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ABSTRACT

A statewide investigation of urban creek sediment toxicity was conducted in California in recognition of increased incidences of toxicity linked to pyrethroid pesticides. The goals were to examine the spatial occurrence and magnitude of sediment toxicity in California urban creeks, and to examine the role of pyrethroids in toxic urban creek sediment samples. After a preliminary screening of ninety sites, thirty creeks were sampled in eight geographical regions. Sediment toxicity was assessed using 10-d bioassays with the resident amphipod *Hyalella azteca*. Bioassays were conducted at two test temperatures of 23°C and at 15°C to provide evidence of the cause of toxicity, and to more accurately reflect ambient environmental temperatures. Twenty-five of thirty samples were toxic when tested at 23°C, and all thirty samples were toxic when tested at 15°C. The magnitude of toxicity increased in samples tested at 15°C suggesting the influence of pyrethroids, which are more toxic at colder temperatures. Pyrethroids were present in all sediment samples and were the only compounds detected at concentrations toxic to *H. azteca*. Bifenthrin was the pyrethroid of greatest toxicological concern, occurring in all 30 samples at concentrations up to 219 ng/g. Pyrethroid contamination of urban creeks was most severe in the Los Angeles, Central Valley, and San Diego regions, respectively. However, pyrethroids were also linked to urban creek aquatic toxicity in all regions sampled, including the less urbanized areas of the North Coast and Lake Tahoe.

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