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Organophosphorus pesticides in the Malibu Creek Watershed

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ABSTRACT

To assess the persistence and magnitude of pesticides in the water column, three streams in the Malibu Creek watershed were sampled for organophosphorus (OP) pesticide (including diazinon and chlorpyrifos) contamination and toxicity to Ceriodaphnia dubia. Dry-weather samples were collected from Malibu Creek and two of its tributaries, Las Virgenes Creek and Medea Creek, at monthly intervals between June 2002 and March 2003. Two storm events were sampled at Malibu Creek in February 2003. Diazinon was the only organophosphorus pesticide detected in any of the creek samples, with measurable amounts in most of the dry-weather samples from Medea Creek, and both of the stormwater samples from Malibu Creek. Concentrations of diazinon in some samples exceeded the California Department of Fish and Game acute water quality criterion by up to a factor of 9, and the chronic criterion by up to a factor of 14. Toxicity was present in some of the samples from each of the streams. Impacted water quality, as indicated by toxicity to C. dubia, appeared to be most severe in Medea Creek and Las Virgenes Creek, where the incidence of reduced survival and reduced reproduction was greater than that measured in Malibu Creek. Dissolved salts such as chlorides and the OP pesticide diazinon contributed to the reduced water quality, but these two constituents had different effects on water quality at the various sites. Diazinon had the most severe toxic effects (complete mortality in two samples from Medea Creek), but did not impact the observed toxicity at Malibu Creek or Las Virgenes Creek. Dissolved salts were shown to be the likely cause of persistent impaired reproduction of C. dubia in many of the samples from all three study sites, indicating that this constituent group is of broad concern throughout the watershed.

Full Text

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2003_04AnnualReport/ar09-brown_pg94-102.pdf