Unintended Consequences of Mosquito Pesticides on the Marine Environment: Potential Effects on the Threatened Staghorn Coral, Acropora cervicornis

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The purpose of this study was to investigate the effects of two commonly used insecticides for mosquito control on the Threatened coral Acropora cervicornis. The chemicals used in this study included Dibrom and Permethrin. While it is thought that the diluted formulations of these insecticides do not pose unreasonable risks to humans, wildlife or the environment, few studies have examined the non-target effects of these applications on corals. Fragments of the coral A. cervicornis were collected in the fall of 2013. These corals were exposed in the lab to seawater containing concentrations of 0.05, 0.5, and 5.0 µg/l from each of the pesticides. These corals were placed in test solutions for 72 hours, after which their viability was determined by visual inspection. Each experimental treatment contained three corals. The results varied by both pesticide and its concentration in seawater. Dibrom in concentrations of 0.05, 0.5, and 5.0 µg/l had no noticeable effects for the duration of the experiment. However, Permethrin concentrations of 5.0 µg/l killed 100% of the corals in that treatment. In addition, Permethrin concentrations of 0.5 µg/l resulted in morbidity of the corals in that treatment. These results showed that A. cervicornis showed some resistance to low levels of Permethrin, however, at high concentrations they were either adversely affected or killed outright. The LD50 calculated for A. cervicornis after a 72 hour exposure to Permethrin is 2.75 µg/l. For the Diabrom treatments there was no significant difference between the control group and the three experimental treatments (P = 0.952). Therefore the null-hypothesis cannot be rejected for Diabrom. For the Permethrin there was a significant difference between the control and the treatments (P = 0.0394).

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