Unintended Consequences of the Sunscreen Compound Oxybenzone on the Threatened Staghorn Coral Acropora cervicornis

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The purpose of this study was to investigate the effects of sunscreen products containing Oxybenzone on the coral Acropora cervicornis. Experimental fragments of A. cervicornis were obtained in the Florida Keys. These corals were exposed in the lab to four experimental Oxybenzone sunscreen treatments diluted in 11 liters of seawater. The corals were dosed in experimental test solutions for 48 hours. Their viability was determined by visual inspection at 12 hour increments starting at time zero. A total of 18 coral fragments were used in this experiment. Each experimental treatment contained three corals placed in each tank. There were four experimental trials (trace, 25 ug/L, 50 ug/L, and 100 ug/L). There were also two control groups, each containing three corals in which no sunscreen was added. For the 100 ug/L treatment, 100% of the corals died outright from exposure after 48 hours. However, there were minimal impacts observed using lower concentrations of Oxybenzone. The null hypothesis was falsified in favor of the alternate hypothesis (H1) which states that if these corals are exposed to varying concentrations of sunscreen containing Oxybenzone then the rate of morbidity and mortality of the staghorn coral, A. cervicornis should be higher in the experimental treatments when compared to the control groups. Also, the higher the concentration of Oxybenzone the greater the impact on the corals. Based on the observed coral mortality vs. concentration, it is possible to calculate the Lethal Dose (LD50) for A. cervicornis. For this experiment the LD50 = 75 ug/L. These results infer that the amount of sunscreens containing Oxybenzone entering the ocean would likely have a significant negative effect on coral health and survival in natural, real world settings.

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