Determining the Distribution of Arginine in Gracilaria salicornia and Codium edule and Fibropapillomatosis Rates in Chelonia mydas in Kane?ohe Bay

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Populations of green sea turtles (Chelonia mydas) in Hawaii have become a source of concern over the past decade due to the tumor-causing disease fibropapillomatosis (FP), the number one cause of mortality in green sea turtles. FP forms internal or external tumors, inhibiting foraging, movement, and organ functions. Previous research suggests a possible cause of FP is elevated levels of the amino acid arginine in algae, their primary food source. Elevated levels of arginine have been associated with high levels of nitrogen in wastewater, as indicated by d15N. In this study, FP amongst the green sea turtle population in Kane?ohe Bay and two of their primary food sources, Gracilaria salicornia and Codium edule, were analyzed. The objective of our research was to assess if there is a relationship between levels of d15N along the coast, rates of invasive, levels of arginine indicated by algae in the diet of green sea turtles and rates of FP in Kane?ohe Bay, Hawai?i. To do this, we surveyed turtles to estimate the distribution of FP and collected algae to analyze arginine and invasive algae. We found a significant relationship (*p<0.05, Fisher’s exact test) between levels of FP in green sea turtles (n=35/87 with FP), raised invasive algae (range=37-98%) d15N indicated arginine levels (n=60, range=0.20-0.38% mass) (*p<0.05, t-test) in algae. This suggests a link between wastewater, invasive algae, arginine and FP in endangered green sea turtles, providing further insight of the causes and distribution of FP and pollution in Kane?ohe Bay.

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