Assessing the Relationship between Habitat and Parasite Infestation among Managed Reef Fishes

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One of the major challenges facing conservationists and managers of marine reef fish resources is to understand the effect of habitat on the growth, mortality, reproductive success, and distribution of reef fishes and thus identify the components of “essential fish habitat” and how these components are affected by anthropogenic activity. One aspect of habitat quality that has been virtually ignored is the likelihood of infestation by parasites. Gnathiid isopod larvae and monogenean flatworms are two of the most common parasites infecting marine reef fishes. Both have larval stages that live in the substratum and emerge to find and infect fish hosts, attach to the body surface and gills, and feed on host blood and body fluids. Gnathiids are removed from hosts by cleaner fishes. However, it is unknown whether any cleaner organisms remove monogeneans. Because these parasites are transmitted from the substratum to hosts directly, rather than between hosts. Factors that affect benthic habitat structure in ways that make habitat more favorable to parasites increase the per capita risk of infestation. This effect can be exacerbated if changes in habitat simultaneously reduce conditions favorable to cleaning organisms and/or coincide with reductions in fish population density and thus the availability of potential hosts. The goal of the proposed project is to develop a protocol for and conduct a preliminary assessment of the relationship between habitat and the per capita risk of infestation of fishes by ectoparasitic gnathiid isopods and monogeneans in the U.S. Virgin Islands. A secondary goal is to examine the effectiveness of cleaner shrimps in removing parasitic monogeneans from fish. These goals demonstrate the intellectual merit of this proposed work. In addition to improving understanding of factors that affect the commercially important USVI fishery, capacity building through increased collaboration and expanded opportunities for students are deliberate examples of the broader applicability of this study.