Temperature-dependent Virulence Factors in the Marine Pathogen *Vibrio coralliilyticus*: A Proteomic Analysis

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Over the past century, a correlation has been observed between increasing temperature and the increased incidence and/or severity of certain infectious diseases. An important example of this observation occurs within the Genus *Vibrio*, where human and coral *Vibrio* outbreaks often occur during the warm summer months. *Vibrio coralliilyticus* is a globally-distributed bacterium that infects corals and their endosymbionts at temperatures above 24°C. Evidence shows that this temperature-dependent virulence is multifactoral, however, the mechanisms underlying pathogenicity have not been fully elucidated. In this study, we use two-dimensional liquid chromatography coupled with tandem mass spectrometry (2D-LC-MS/MS) to detect proteins produced by *V. coralliilyticus* ATCC BAA 450 at a non-pathogenic (24°C) and pathogenic (27°C) temperature. Utilizing the newly sequenced genome of *V. coralliilyticus* ATCC BAA-450 (GenBank:ACZN00000000) in conjunction with TurboSEQUEST and Scaffold, we compare virulence factors produced by *V. coralliilyticus* at the two temperatures in order to identify potential mechanisms of temperature-associated pathogenicity. Our results reveal a significant increase in the number and expression level of virulence factors produced by *V. coralliilyticus* cultivated at 27°C. Proteins associated with quorum sensing, flagellar-mediated motility, secretion systems, host degradation, and antibiotic resistance were increased at 27°C, indicating they may contribute to the increased virulence of *V. coralliilyticus* at the higher temperature. This study's significance is enhanced by climate change predictions indicating that surface seawater temperatures will soon reach above 27°C for the majority of the year throughout the tropics.

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