

Influences of seasonality on coral diseases in Thailand

Heru Kusdianto*, Dewi Embong Bulan, Suchana Chavanich and Voranop Viyakarn

Reef Biology Research Group, Department of Marine Science, Faculty of Science, Chulalongkorn University, Bangkok, 10330, Thailand

Incidences of diseases in corals have been linked to numerous biotic and abiotic stressors throughout global reefs. Among these are the wide-ranging impacts caused by changing global climate such as elevated sea surface temperatures (SSTs) and increased frequency of extreme weather phenomena, such as storms. The influence of rainfall and nutrient loading on coral diseases have been documented from numerous locations around the globe but such links have not been made in Thailand. Transect surveys along coral reefs at Trang (Andaman Sea) and Chonburi (Gulf of Thailand) were carried out in 2016 and 2017 during both South-West (June to September) and North-East (October to February) monsoon seasons. Both sites see increased rainfall during South-West monsoons when compared to the North-East monsoon which undergoes less precipitation. Coral diseases were documented at 5.9% (+/-1.1) and 10.1% (+/-3.5) at Chonburi and Trang respectively during the North-East monsoon, with both sites showing increased prevalence during South-West monsoon at 14.8% (+/-1.2) and 12.5% (+/-0.9) at Chonburi and Trang respectively. The most common disease observed was White Syndrome. Microbial analyses were carried out on healthy and recently diseased colonies of *Platygyra* corals in ex-situ hatchery conditions at Chonburi, immediately after the South-West monsoon period of 2015, prior to which these diseases were absent at the hatchery. Results showed a sharp increase in *Vibrio* spp. bacteria in diseased corals at 42%, making it the dominant group in the corals. Healthy corals observed dramatically reduced abundances of *Vibrio* spp. making up only 7% of bacterial density. These findings support numerous studies implicating elevated abundances of *Vibrio* spp. bacteria in coral disease incidences, and additionally suggest that *Vibrio* densities in the upper Gulf of Thailand may be influenced by post-monsoon, cooler waters where nutrient densities are also higher.