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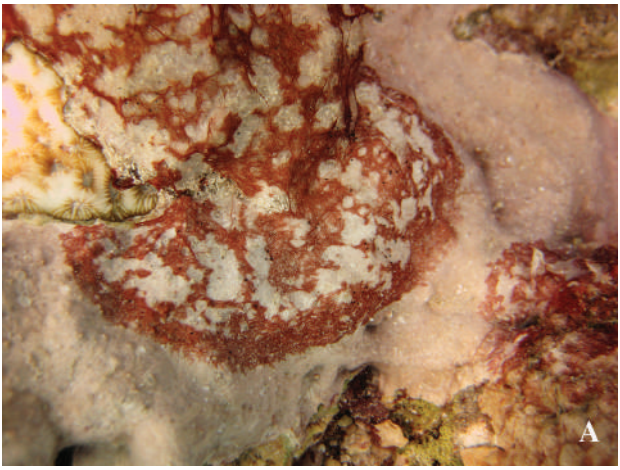
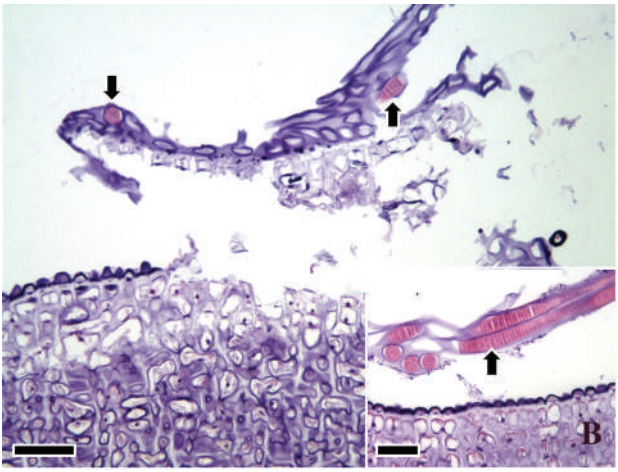
The first cyanobacterial infection of crustose coralline algae discovered on the reefs of Pohnpei, Micronesia

Greta S Aeby[1], Thierry M Work[2], Konrad A Hughen[3]*

[1] *Hawaii Institute of Marine Biology, PO Box 1346, Honolulu, Hawaii 96744.*
[2] *US Geological Survey, National Wildlife Health Center, Honolulu Field Station, PO Box 50167, Honolulu, Hawaii 96850.*
[3] *Woods Hole Oceanographic Institution, Woods Hole, Massachusetts 02543.*
** Corresponding author email: <greta@hawaii.edu>.*





Crustose coralline algae (CCA) can cover substantial areas on living reef benthos (Adey et al. 1982, Keats et al. 1997), are important to reef integrity by acting to cement reefs together (Littler and Littler 1984), and serve as recruitment sites for coral larvae (Lasker and Kim 1996, Harrington et al. 2004, Price 2010). Despite their importance, relatively little is known about CCA biology, ecology (Chisholm 2003), or their susceptibility to disease (Vargas-Angel 2010, Williams et al. 2014). Diseases are increasing rapidly on reefs in the Indo-Pacific region, yet

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there are many areas that still lack critical baseline surveys. Here we report a new CCA disease found at two sites on reefs in Pohnpei, Micronesia, discovered as part of a larger effort to document baseline levels of coral and CCA disease in Micronesia. The disease appeared as distinct, semi-circular lesions on CCA with a band of red filamentous material along the leading edge of the lesion (Panel A). The central portion of the lesion was sparsely covered by similar material, under which was pale and apparently degraded CCA. Upon histological evaluation, we confirmed that the filamentous material was cyanobacteria and that it was invading intact and fragmented thalli (Panel B). CCA typically uses epithallial shedding to remove unwanted colonizers (Keats et al. 1997), but in this case, the pathogenic cyanobacteria were able to overcome host defenses and invade the CCA. We found 0.07 cyanobacterial lesions m^{-2} CCA at one site and 0.14 lesions m^{-2} CCA at a second site. Both sites were located on the west side of Pohnpei at approximately 7–9 m depth. One site was on the fore reef with the other site situated nearby (approximately 1.64 km) on the back reef. These two sites were not located near any major population centers found on the island. This CCA disease was not observed at any of the other 22 sites surveyed within Micronesia. This is the first CCA disease found associated with filamentous cyanobacteria and the first report of any CCA disease from Pohnpei.

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