

## **Coral disease on reefs in Sogod Bay, Leyte in July 2007. A preliminary study for Coral Cay Conservation**

Greta Smith Aeby, PhD. (Hawaii Institute of Marine Biology)

Douglas Fenner, PhD. (American Samoa Dept. of Marine and Wildlife Resources)

Coral disease has devastated coral reefs in the Florida Keys and is emerging as a problem in the Indo-Pacific. Efforts are now underway by several disease researchers to document and understand disease occurrence throughout the Indo-Pacific. A brief visit to the Ampo base of Coral Cay at Sogod Bay, Leyte, in July 2007 allowed the opportunity to initiate disease surveys in this region. A total of 9 dives were made with both quantitative and qualitative observations of coral disease conducted. Three sites were qualitatively surveyed for coral disease: Apo reef (n= 5 dives), Santa Sophia MPA (n=3 dives), Lema Sawa (n=1 dive). Divers swam at random and photographed and recorded all corals with signs of disease. In addition, limited quantitative surveys were conducted at Apo reef (n= one 25x1m belt transect) and Santa Sophia MPA (n= one 22x2m belt transect and one 13x2m belt transect). Disease occurrence was recorded within each of these belt transects.

A total of 11 different coral diseases were observed (Table 1) with the most common disease being black band disease (Fig. 1) which was found affecting 5 genera of coral. There were differences found among sites with the highest occurrence of disease at Apo reef and no disease found at Lema Sawa. This is, in part, due to differences in effort at each of the sites. However, Apo Reef had much higher levels of black band disease on the reef flat as compared to either of the other survey areas. Black band disease was first reported from the Philippines in 1985 (Antonius 1985) and has also been reported from the Great Barrier Reef (Miller 1996, Willis et al. 2004, Page & Willis 2006), Sulawesi, Indonesia (Haapkyla et al. 2007), and Fiji (Littler & Littler 1996). It has not yet been reported from American Samoa, Johnston Atoll or the Hawaiian archipelago despite numerous disease surveys (Aeby 2006, Aeby et al. unpublished data). Certain stressors such as poor water quality (Kuta & Richardson 2002, Antonius 1985), mechanical damage (Antonius 1985, Aeby & Santavy 2006) or elevated seawater temperatures (Kuta & Richardson 2002) are all thought to be important in determining the occurrence and prevalence of BBD. As such, it may be important to note differences in disease occurrence among sites as they can give clues as to the general health of the reef. On Apo reef we documented 17 cases of BBD yet did not find any BBD infected colonies on either of the other reefs surveyed. Another interesting observation was that BBD was never found on acroporids at Apo reef despite the high abundance of that particular coral genus. In contrast, on the GBR, BBD is found predominantly on *Acropora* (Willis et al. 2004, Page & Willis 2006).

Quantitative surveys were conducted on the reef slopes at Apo reef and at Santa Sophia MPA to look for differences in disease levels among sites and to determine the feasibility of incorporating disease assessment into Coral Cay's established monitoring methodology. The short dive time (~40min) limited what could be accomplished but the general disease methodology seemed to mesh nicely with the rest of the standard survey

methods. Disease was found to be more common on the reef slope at Apo (0.04 diseased colonies/m<sup>2</sup> reef surveyed) as compared to Santa Sophia (0.01 diseased colonies/m<sup>2</sup> reef surveyed). Based on the diversity of coral diseases found within this short study, the differences in diseases among sites and the apparent compatibility of disease survey methods with Coral Cay's monitoring program, it is recommended that complete coral disease baseline surveys be conducted at their sites and the inclusion of disease surveys be considered in the future for Coral Cay's monitoring program.

### **Literature cited**

- Aeby, G.S. 2006. Baseline levels of coral disease in the Northwestern Hawaiian Islands. *Atoll Research Bulletin* 543:471-488.
- Aeby, G.S. and Santavy, D.L. 2006. Factors affecting the susceptibility of the coral *Montastrea faveolata* to black-band disease. *Mar Ecol Prog Ser* 318:103-110.
- Antonius, A. 1985. Coral disease in the Indo-Pacific: a first record. *PSZNI Mar Ecol* 6:197-218.
- Haapkyla, J., Seymour, A., Trebilco, J. and D. Smith. Coral disease prevalence and coral health in the Wakatobi Marine Park, south-east Sulawesi, Indonesia. *J Mar Biol Ass UK* 87:403-414.
- Kuta K. and L. Richardson. 2002. Ecological aspects of black band disease of corals: relationships between disease incidence and environmental factors. *Coral Reefs* 21:393-398.
- Littler, M. and D. Littler. 1996. Black band disease in the South Pacific. *Coral Reefs* 5:20.
- Miller, I. 1996. Black band disease on the Great Barrier Reef. *Coral Reefs* 15:58.
- Page, C & B. Willis. 2006. Distribution, host range and large-scale spatial variability in black band disease prevalence on the Great Barrier Reef, Australia. *Dis Aquat Org* 69:41-51.
- Willis, B., Page, C. and E. Dinsdale. 2004. Coral disease on the Great Barrier Reef. Pages 69-104 in E. Rosenberg and Y. Loya, eds. *Coral Health and Disease*. Springer-Verlag, Germany.

Table 1. Disease occurrence in each of the sites surveyed on Leyte in July 2007.

	<b>Apo reef</b>	<b>Santa Sophia MPA</b>	<b>Lema Sawa</b>
# dives	5	3	1
<b>Growth anomalies (GA)</b>			
<i>Echinopora</i> GA	X		
<i>Favia/Favites</i> GA		X	
<i>Hydrophora</i> GA		X	
<b>Black band disease (BBD)</b>			
<i>Goniopora</i> BBD	X		
<i>Platygyra</i> BBD	X		
<i>Pachyseris</i> BBD	X		
<i>Echinopora</i> BBD	X		
<i>Astreopora</i> BBD	X		
<b>White syndrome (WS): subacute tissue loss</b>			
<i>Acropora</i> WS	X		
<i>Physogyra</i> WS		X	
<i>Platygyra</i> WS		X	
<i>Gonipora</i> WS	X		
<b>Chronic Focal Tissue loss (TL): chronic tissue loss</b>			
<i>Goniopora</i> chronic focal TL	X		
<i>Oxypora</i> chronic focal TL		X	
<b>Multi-focal tissue loss (MFTL)</b>			
<i>Porites</i> MFTL		X	



**Figure 1.** *Pachyseris* sp. infected with black band disease on Apo Reef, Philippines.