EFFECT OF COLONY SIZE AND SURROUNDING SUBSTRATE ON CORALS EXPERIENCING A MILD BLEACHING EVENT ON HERON ISLAND REEF FLAT

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The lost of symbiotic dinoflagellates and photo-synthetic pigments among scleractinian corals has been described as coral bleaching. This phenomenon is consequence of a deterioration of the host intra-cellular environment that leads to the breakdown of the functional symbiosis. Thermal stress has been described as one of the main factors generating coral bleaching. A continuous period of time with temperatures over the thermal limit for a functional symbiosis can lead to mass bleaching events followed by loss of extended section of reef due to coral mortality. The majority of the studies related to coral bleaching have focused on massive bleaching events, while mild bleaching events like the one experienced by Heron Island Reef in the summer of 2006 has been poorly studied. In this study we used coral colony size as a continuous variable to determine if there are differences in bleaching between different coral morphs (*Acropora*, other branching corals, massive *Porites* and other massive corals) as well as whether these differences are affected by the substrate that surrounds individual colonies. The size of the individual colonies did not affect the outcome of the bleaching event for any of the morphs, as opposite as what has been found on studies of mass bleaching events. This result suggests that there may be a level of stress over which colony size becomes an issue. We found that massive corals showed a lighter average relative color (more bleached) but with less variability in color between colonies. In contrast, branching corals showed a darker relative color but with more variability between colonies. Massive corals surrounded by sand appeared more bleached than those surrounded by calcium carbonate or rubble, while for branching morphs there where no differences between the substrate. We hypothesize that the reflectance of light from the sand magnifies the amount of light that the colony is exposed to, increasing the level of light stress. These results show the importance of studying sub-lethal coral bleaching for the understanding of the changes that coral communities are experiencing on this climate changing world.