Bleaching corals of two species appear to feed from neighboring algal turfs

Fig. 1 Partially bleached corals with mesenterial filaments extended into nearby algal turfs. **a** and **b** *Colpophyllia natans*. **c** *Montastraea faveolata*. A small number of interactions with branching macroalgae (*Dictyota* sp.) are also visible in **(b)** and **(c)**. All scale bars are approximately 0.5 cm

During bleaching, corals typically cannot obtain sufficient energy from their symbiotic dinoflagellates alone and must therefore rely on alternative energy sources such as plankton, lipid reserves (e.g., Grottoli et al. 2004), and photosynthate from endolithic algae (Fine and Loya 2002). Another possible strategy for energy acquisition during bleaching is described here. On three consecutive nights in October 2010, five heavily bleached colonies of *Colpophyllia natans* were observed extending their mesenterial filaments from the colony edge into neighboring algal turfs up to 4 cm away (Fig. 1a, b). The same behavior was observed in one bleaching colony of *Montastraea faveolata* (Fig. 1c). All observations were made between 20:00 and 23:00 h at depths of 7–9 m. Mesenteries were observed interacting only with algal turfs and occasionally with larger fragments of macroalgae (Fig. 1a, c), but not with neighboring corals or bare substrate.

Turf algae are known to exude glucose and other photosynthetic products from their tissues (Haas et al. 2010). The bleaching corals may have used their extended mesenteries to feed on this photosynthate, on the diatoms, microalgae, and heterotrophic bacteria shown to be associated with the macroalgae at this same study site (Barott et al. 2011), and/or on the microfauna sheltered within the turfs. *Colpophyllia natans* is known to fight neighboring corals using its relatively long mesenterial filaments; however, neither *C. natans* nor *M. faveolata* is known to “fight” algal turfs. Furthermore, this behavior was observed only during an extended coral bleaching event and never in 30 preceding hours of nighttime observation or 100+ total hours of observation at this site (Water Factory, Curaçao, 12°10′91″N, 68°95′49″W). Thus, the behavior described here is most likely a feeding strategy used by corals undergoing an extended period of bleaching. Because most research on coral bleaching is conducted during the day, the generality of this behavior is not known. More broadly, this observation highlights the fact that simultaneous changes to reef health and community structure (such as more frequent coral bleaching events and long-term increases in turf algal cover) may occur for different reasons and at different rates but may nevertheless act together to reveal previously unknown acclimatization behaviors in coral reef organisms.

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Received: 10 April 2011 / Accepted: 11 May 2011 / Published online: 17 June 2011

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Coral Reefs (2011) 30:651

DOI 10.1007/s00338-011-0782-y