Severe consequences for anemonefishes and their host sea anemones during the 2016 bleaching event at Lizard Island, Great Barrier Reef

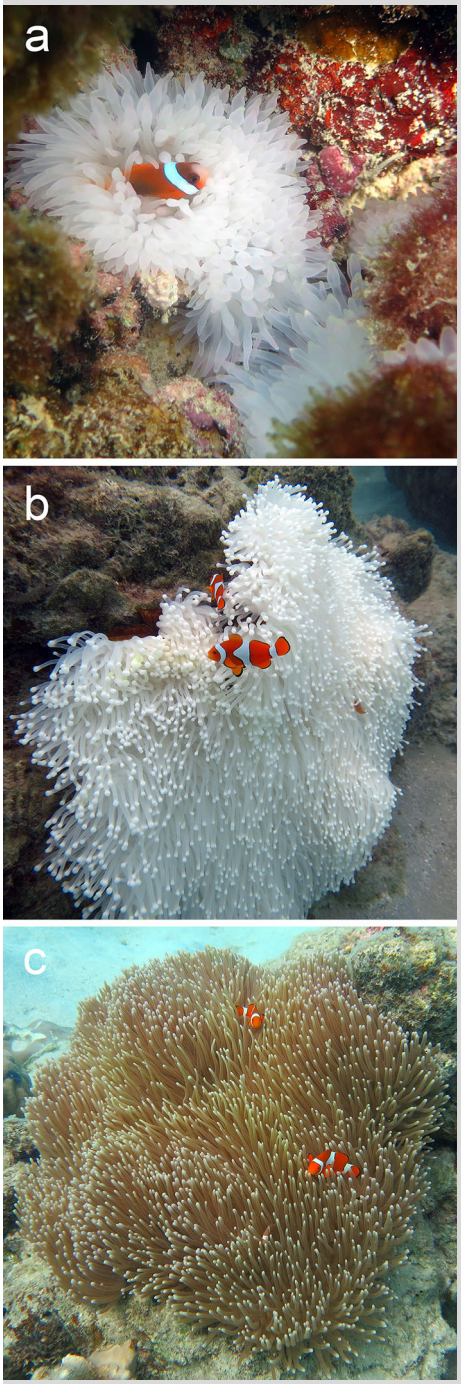

Fig. 1 **a** Bleached *Entacmaea quadricolor* with *Amphiprion melanopus*, **b–c** bleached and recovered *Heteractis magnifica* with *A. percula*

Elevated sea surface temperatures between February and April 2016 resulted in the most extensive and severe thermal bleaching event on record on the Great Barrier Reef (GBR), with the majority of northern reefs experiencing extreme bleaching (>60% of corals bleached) (Hughes et al. 2017). Most research has documented the effects of the bleaching on reef building corals, yet there are less-studied microhabitats that bleach, such as sea anemones that provide essential habitat for one of the reefs most iconic fishes, the anemonefishes (Hobbs et al. 2013; Hill and Scott 2012). We tracked the fate of tagged sea anemones and associated anemonefishes within the Lizard Island lagoon (14°40′S, 145°27′E, 1–5 m depth) for 6 months following the thermal anomaly.

Between 10 and 15 April, all *Entacmaea quadricolor* (n = 2 solitary and 10 clonal clusters), *Heteractis cripsa* (n = 1), and *H. magnifica* (n = 1) found were bleached (Fig. 1a, b). These bleached anemones provided habitat for 19 *Amphiprion melanopus*, three *A. percula*, and two *Premnas biaculeatus*. We also found three *Stichodactyla mertensii* with nine resident *A. clarkii* that showed no signs of bleaching. When they were revisited from 17 to 22 October, the *H. magnifica* had recovered (Fig. 1c), while the *H. crispa* was no longer there, presumed dead. One solitary *E. quadricolor* remained bleached and three clusters were recovering, but the majority were gone (one solitary individual and six clusters comprising at least 23 individuals). This reduction in habitat resulted in the disappearance of nine (47.4%) *A. melanopus*. There were no changes in the abundance of *A. clarkii*, *A. percula,* or *P. biaculeatus*. The differential susceptibility and mortality of host anemones to bleaching have direct implications for the anemonefish occupying those habitats.

References

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