***Drupella* outbreak in a large coral community off the coast of Cape Toi, Miyazaki, Japan**

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Off the coast of Cape Toi, Miyazaki, Japan (31°21'N 131°19'E), thousands of colonies of the tabular coral species *Acropora hyacinthus* densely inhabits an area of approximately 300×300 m at depths of 3–5 m (Fig. 1A). This coral community was discovered in March 2012 by one of the co-authors (M. Fukuda) and is believed to be one of the largest communities of *A. hyacinthus* off the coast of Kyushu. In southern Miyazaki, reef-building corals had been found in abundance before the outbreak of the coral-eating snails *Drupella fragum* in 1987, which drastically diminished the coral population in this region (Takayama and Shirasaki 1990; Uchida 1994). Therefore, rediscovery of the coral community in southern Miyazaki

Fig. 1 **A** Large community of *Acropora hyacinthus* off the coast of cape Toi. **B** *Drupella* aggregation under the coral colonies. **C** Damages of corals by *Drupella* feedings. **D** Many egg-capsules laid on coral skeleton by *Drupella*. Bar shows 10 mm. **E** Eggs within an egg-capsule of *Drupella*. Bar shows 1 mm. **F** Cleavage of a fertilized egg (the major axis about 0.1 mm) of *Drupella* spp. sampled in Jan. 15, 2016. Bar shows 0.1 mm.

would indicate recovery of coral community. Although corals in the region had been seriously damaged by outbreaks of *Acanthaster planci* since December 2011, *A. hyacinthus* coral community was successfully protected without serious damage (Nichinan Coast Coral Community Preservation Association pers. comm.). However, in March 25, 2014, we found widely scattered feeding scars to this coral community by *Drupella* spp. (we subsequently captured 0.7 kg of the snails; 2–3 g per individual). On January 15, 2016, we discovered another outbreak of *Drupella* spp. (13.8 kg) in this coral community (Fig. 1B) [Cumming (2009) defined non-outbreak *Drupella* assemblages as those having densities of 0–2 individuals per m²]. In Japan, *D. cornus*, *D. fragum*, *D. eburnea*, *D. rugosa*, and *D. minuta* have been identified as coral-eating snails (Tsuchiya 1992). In Cape Toi, most of the identified species were *D. fragum*. In this area, only 3–10 *Drupella* individuals were found on the surfaces of the corals with feeding scars, but hundreds of snails aggregated under these colonies (>100 snails were found under one coral colony) (Fig. 1B, C). On January 15, 2016, we also found large numbers of *Drupella* egg capsules on dead coral skeletons (Fig. 1D). Most unhatched capsules (103 eggs in a capsule, n=1, other three contained almost the same) still remained (Fig. 1E) and appeared to develop normally (Fig. 1F) even during the winter season when seawater temperature was 18 °C. Previous studies showed that *Drupella* are more attracted to stressed corals than to unstressed ones (Cumming 2009; Tsang and Ang 2015). In this coral community, the recent outbreak of *A. planci* may have triggered the mass aggregation of *Drupella* spp. Careful monitoring of the conditions of this coral community and frequent sampling of individuals and egg capsules of *Drupella* (Fig. 1F) will be necessary to protect this coral community in the future.

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