Fluorescence in eggs of the coral *Montipora capitata*

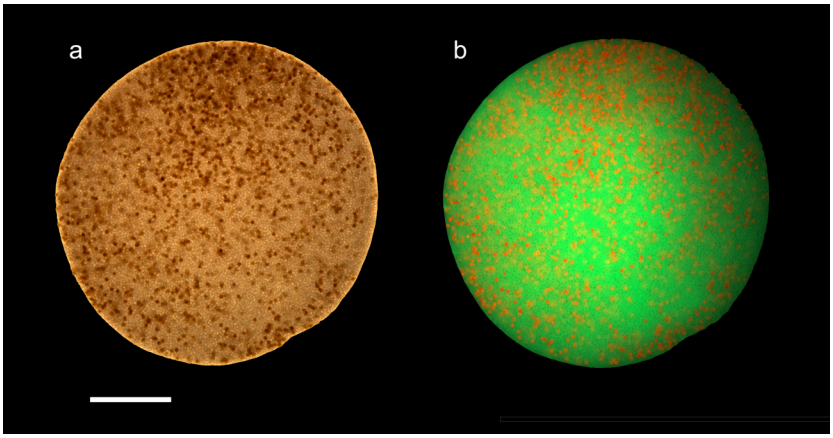

Fig. 1 *Montipora capitata* egg under (a) white light and (b) blue light; scale bar= 120µm. In (b), the green fluorescence is from fluorescent proteins and the red fluorescence is from chlorophyll in the symbiotic dinoflagellates.

Fluorescence is ubiquitous in corals and results from a family of fluorescent proteins (FPs) present in many Cnidarians. FPs usually refer to the host-based pigments that are homologous to GFP, the widely studied green fluorescent protein originally isolated from a jellyfish. Fluorescent pigments are pervasive in adult Scleractinian corals (Salih et al. 2000). The fluorescence of coral eggs was first noted by Hirose et al. (2000). Here, we show an egg of the coral *Montipora capitata* under white light and its fluorescence under blue light (Fig. 1). We measured the spectral characteristics of eggs and found that they emit blue-green light (λ=491nm, 3nm resolution) and far-red light (λ=682nm, 3nm resolution) when excited by blue light (450nm). The blue-green emission is similar to that produced by FPs in adult corals, including this species. The far-red light is produced by the chlorophyll in the photosynthetic endosymbionts. No additional fluorescent emissions were observed with different excitation wavelengths under epifluorescence microscopy. FPs are present in every life stage of corals, eggs, embryos (Leutenegger et al. 2007), and adults (Salih et al. 2000), suggesting its function is important in corals. While the role of FPs remains elusive, most evidence supports a photoprotective function (Salih et al. 2000). FPs could help dissipate excess light energy, aiding larval survivorship. In contrast, the sperm were not fluorescent, which is appropriate because *M. capitata* sperm are released and fertilize eggs at night.

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