

Evidence of light-induced phenotypic plasticity in zoanths: editorial comment on the feature article by Wei et al.

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Phenotypic plasticity refers to the morphological variation of a single genotype across different environments (Kelly et al. 2012). The adaptive advantage of phenotypic plasticity includes the capacity for adjusting to variable environments across multiple habitats and over time as environments experience change. This ability has been documented in a range of benthic marine organisms, including corals (Hoeksema 2012). Like corals and anemones, zoanths are anthozoans which often harbour symbiotic dinoflagellates (from the genus *Symbiodinium*). However, zoanths have received considerably less attention compared to their cnidarian counterparts, with respect to their ecology. It is known that zoanths exhibit high intraspecific morphological variability (Reimer et al. 2004), but it has been unclear whether this is due to polymorphism, phenotypic plasticity, or a combination of both.

The study by Wei et al. (2013) presents the first evidence for phenotypic plasticity in zoanths. Colonies of *Zoanthus sansibaricus* and *Palythoa tuberculosa* all displayed light-induced changes in morphology. Based on reaction norms, principal components analysis, analysis of variance, and canonical discriminant analysis, the authors demonstrate morphological differences between shading treatments, but also between local populations and a population \times treatment effect. Polyps of shaded colonies were generally larger and taller than those of unshaded colonies.

Population \times environment interactions show that populations of both species varied in the magnitude and direction of their morphologic responses to shading, suggesting some degree of acclimatization or local adaptation to natal reefs. Importantly, the authors have provided evidence that environmentally mediated changes can contribute to the morphological variation often described in zoanths (Burnett et al. 1997). These morphologically plastic attributes may enable them to withstand temporal changes in their environment. In addition, given phenotypic plasticity is often associated with a generalist life strategy, these species of zoanths may survive in spatially variable habitats (van Tienderen 1991). Therefore, this study not only clarifies the effect of illumination in zoanths but also gives a more general insight on morphology in anthozoans that harbour symbiotic algae.

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