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PG-19 Onset and flexibility of symbiosis and effect of symbiotic dinoflagellate on energy source in scleractinian coral larvae

Saki Harii¹, Naoko Yasuda¹, Mauricio Rodriguez-Lanetty², Michio Hikada³

¹ Graduate School of Engineering and Science, University of the Ryukyus; ² The University of Queensland; ³ Faculty of Science, University of the Ryukyus

The establishment of symbiosis in early developmental stages is important for reef-building corals. Some coral eggs or planulae receive symbiotic dinoflagellates directly from their parents, while others acquire them from the environment. Although the latter larvae of some corals acquire symbiotic dinoflagellates, little is known about the process of the establishment of this symbiotic relationship. In addition, presumably, planulae with symbiotic dinoflagellates consume photosynthetic products as well as lipids as energy sources, however, measurement of the effect of symbionts on energy sources has received little attention so far. We have examined 1) the uptake of symbiotic dinoflagellates by larvae in seven scleractinian corals, 2) the timing of uptake and the flexibility and 3) the temporal changes in survivorship and lipid content after acquisition in *Acropora* larvae. The results show that planulae of four acroporid species, *A. (Isopora) palifera*, *Favia pallida*, and *Ctenactis echinata* acquired symbiotic dinoflagellates. The uptake of symbiotic dinoflagellates occurred 5 and 6 days after spawning in *A. intermedia* and *A. digitifera*, respectively. More than 79 % of the larvae in both species acquired symbionts isolated from three different and separate hosts. The number of symbionts from homologous corals was the highest in *A. intermedia* and that of the symbionts from *Aiptasia* sp. was the highest in *A. digitifera*, however, it was not significantly different among the types in both species. Our results suggest that the larvae in different genus can acquire symbiotic dinoflagellates and have flexibility in the early stage of corals. In addition, survivorship was always lower in the larvae with symbionts than that of the larvae without symbionts through the experimental periods, although it was not significant. Lipid contents in the larvae significantly decreased under both conditions through the experimental periods. However, it was not significantly different between the conditions. Since the number of symbiotic dinoflagellates in the larvae was low, the symbionts did not provide enough photosynthetic products to the larvae. Although we cannot conclude firmly in the present study, the symbiotic dinoflagellate may provide energy to the larvae and may allow higher larval survivorship.