PA-001 (JTK):

The dynamics of bacterial diazotrophic communities within the corals *Acropora tenuis* and *Pocillopora verrucosa* in Okinawa shallow reef, Japan

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Diazotroph bacteria (nitrogen fixing) within and surrounding corals potentially an important role in providing accessible nitrogen to coral reef ecosystem. This study demonstrated the dynamics of bacterial diazotrophic communities by using *nifH*, a gene encoding a subunit of dinitrogenase within the coral metagenomes of *Acropora tenuis* and *Pocillopora verrucosa* across seasons at two environmentally different sites. We used 454 pyrosequencing to investigate diazotroph composition in the two coral species and seawater surrounding corals during four sampling times in 2013 to 2014. The results showed that the diazotroph composition structures differed in both corals and coral-surrounding seawater at two reefs location, Ishikawabaru and Sesoko Minami. We found different seasonal shift of diazotroph compositions depending on colonies and branches in both corals. Our findings suggested that the factors for diazotroph community formation in both corals did not only depend on seasonal change or environmental conditions but also on specific association of diazotrophs with each coral colony.

keywords:Diazotroph,454 pyrosequencing,coral reef,Acropora tenuis,Pocillopora verrucosa