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PG-9 **Genetic structures of populations of the scleractinian coral *Acropora* (*Isopora*) *brueggemanni* in the Ryukyu Archipelago**

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Acropora (*Isopora*) *brueggemanni*, which is distributed throughout the Ryukyu Archipelago (Okinawa Island, Miyako Island, and the Yaeyama Islands), is a brooder coral, meaning that it produces planula larvae. Our studies showed that some of the released planulae might be produced by self-fertilization, although there was no apparent periodicity of planula release, and only a few planulae were released intermittently under cultured conditions. Although this coral has a branched shape with short stout branches, asexual reproduction via fragmentation occurs very frequently under natural conditions.

To clarify the relative contributions of self-fertilization and fragmentation to the genetic structure of the local populations, and to genetically estimate the population connectivity of *A. brueggemanni*, we performed population genetic analyses using microsatellite markers.

We sampled *A. brueggemanni* from 19 populations at three sites in the Ryukyu Archipelago (three from the Kerama Islands, three from Miyako Island, three from Ishigaki Island, and ten from Sekisei Lagoon). A total of 313 colonies were genotyped using three microsatellite markers, Ib2, Ib12, and Ib13, which were developed in *Acropora digitifera*. The number of effective alleles per locus ranged from 2.65 to 8.46 in the samples, while the expected level of heterozygosity ranged from 0.20 to 0.50. The level of heterozygosity in 16 of the 19 populations differed significantly from that expected under Hardy-Weinberg equilibrium. When averaged over all three loci and all of the populations, our results revealed great genetic differentiation (F_{ST}=0.29, R_{ST}=0.15, $P < 0.01$ for each locus and overall). A principle coordinates analysis, based on a genetic distance matrix, revealed moderate genetic groups among the sites, and Simpson's diversity index, which is an indicator of clonal structure, ranged from 0.19 to 1.0.

Our results show that the clonal structure and genetic diversity of each population of *A. brueggemanni* were very different, and that there was significant genetic differentiation among the populations. One explanation for these results is that, in this coral, gene flow may not occur frequently following planulae recruitment, and populations may be maintained and renewed by various reproductive modes (e.g., sexual reproduction, including self-fertilization, and asexual reproduction via fragmentation).