Attempts to detect genetic difference among sibling planulae and between parent and offspring of the coral Pocillopora damicornis: Microsatellite and ITS

PG-10 Attempts to detect genetic difference among sibling planulae and between parent and offspring of the coral *Pocillopora damicornis*: microsatellite and ITS

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It has been believed that *Pocillopora damicornis* in Western Australia and Hawaii consistently displayed the same allozyme pattern as the parent colonies for five polymorphic loci including one or two heterozygous loci. On the other hand allozyme studies suggested that populations of *P. damicornis* in Great Barrier Reef (GBR) show high genotypic diversity expected from random mating and hence are maintained by recruitment of sexually produced larvae. Thus, there is inconsistency between the supposed asexual origin of planulae and the genetic structure of adult colonies of *P. damicornis* populations. Moreover, early embryonic stages were observed within polyps of the coral from an Okinawan population, indicating that planulae are produced sexually at least in the population. In the present studies, different markers than allozyme were used to detect possible genetic difference among sibling planulae or between parent and offspring of Okinawan *P. damicornis*. PCR-DGGE (Denaturing Gradient Gel Electrophoresis) analysis of ITS1 showed, in one family of Bise02#03YL, 2 out of 15 planulae tested showed bands whose position appeared to be different from those of their brood parent and the rest of the sibling planulae. PV7, a microsatellite locus in the ITS1 region, was sequenced for the maternal colony and 3 planulae including two that showed different band pattern from others. Planula P6-4 showed 2 different PV7 sequences. Nine out of 11 clones displayed the same sequence as the parent and other two planulae while 2 clones showed a different sequence. This suggests that P6-4 planula might be a heterozygote and contain an allele that was absent in its parent colony and sibling planulae. Fragment analysis of PV5, another microsatellite, showed that another planula P6-3 was a heterozygote while its parent and other sibling planulae were homozygous. The present results demonstrated genetic differences among sibling planulae or between parent and offspring, hence that planulae are derived sexually through cross-fertilization. However, the number of genetically different planulae was small, suggesting that most planulae developed through self-fertilization or parthenogenesis instead of out-crossing