

Application of Denaturing Gradient Gel Electrophoresis (DGGE) Methods on Parent-Offspring Relationship of the Coral *Pocillopora damicornis*

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Abstract

DGGE (Denaturing Gradient Gel Electrophoresis) is the most powerful method for mutation detection currently available. In DGGE, DNA fragments of the same length but with different sequences can be separated. The sensitivity of DGGE to slight sequence differences is high since single base changes could be observed. There has been a debate about whether planulae of the coral *Pocillopora damicornis* are produced sexually or asexually. If produced sexually, planulae are expected to be genetically different from each other and also from their parents. In order to detect possible genetic difference between planulae and their parents, DGGE analysis of ITS2 region of rDNA was used. If there are genetic differences, it is proved that planulae are produced sexually. A total 49 adult colonies and 78 planulae from 11 localities were used for analysis. However, only in 2 families (BiseO1#O2 and BiseO2#O3YL) showed different DGGE profile, suggesting genetic difference between parent and offspring. The attempt to detect genetic difference in planulae of *P. damicornis* and their parents using DGGE method was not completely successful since DGGE method can not prove clearly the genetic difference between parent and offspring. However, the possibility that DGGE method is applicable for studying coral can be suggested. PCR-DGEE amplification may perform with new STR (short tandem repeat) polymorphic loci of *P. damicornis* that currently found to answer whether planulae are produced sexually or asexually.

Key words : *Pocillopora damicornis*, planula, DGGE, sexual reproduction, coral

Abstrak

DGGE (Denaturant Gradient Gel Electrophoresis) merupakan salah satu teknik akurat untuk mengetahui mutasi DNA. Sensitivitas DGGE sangat tinggi, karena dengan menggunakan DGGE, fragmen DNA yang memiliki panjang basa yang sama dapat dipisahkan hanya berdasarkan perbedaan satu basa penyusunnya saja. Model reproduksi karang *Pocillopora damicornis* telah lama menimbulkan perdebatan. *P. damicornis* dilaporkan memproduksi planulae secara seksual dan aseksual. Jika diproduksi secara seksual, planula akan berbeda secara genetik dengan induknya. Analisa DGGE dikombinasikan marker ITS2 dari rDNA digunakan untuk mendeteksi perbedaan tersebut. Jika terdapat perbedaan genetik, dapat disimpulkan planulae diproduksi secara seksual. Analisa dilakukan terhadap 53 koloni dan 78 planulae dari 1 / lokasi yang berbeda. Dua famili (Bise01#02 and Bise02#03YL) mempunyai profil DGGE berbeda antara planulae dan induknya. Hal ini menunjukkan adanya perbedaan susunan gen antara planulae dan induknya dan kemungkinan produksi planulae dilakukan secara seksual. Namun demikian, kombinasi analisa DGGE dan marker ITS2 dari rDNA kurang memuaskan. Saat ini telah ditemukan STR (short tandem repeat) spesifik untuk *P. damicornis*. Kombinasi penggunaan amplifikasi PCR-DGGE dengan STR diharapkan lebih akurat untuk menjawab permasalahan produksi planulae pada karang *P. damicornis*.

Kata kunci: *Pocillopora damicornis*, planulae, DGGE, reproduksi seksual, karang