



Comparison of genetic diversity between wild-caught broodstock and hatchery-produced offspring populations of the vulnerable Korean kelp grouper (*Epinephelus bruneus*) by microsatellites

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ABSTRACT. The kelp grouper *Epinephelus bruneus* (Perciformes: Haemulidae), is one of the most economically important fishery resources in Korea. This fish is regarded as a target for prospective aquaculture diversification; therefore, maintenance of stock quality is important. To investigate the effects of current artificial reproduction in a hatchery facility, genetic variation in wild-caught broodstock and hatchery-produced offspring of kelp grouper was analyzed using eight polymorphic nuclear microsatellite DNA loci; 77 alleles were

identified. Allelic variability ranged from 2 to 22 in the broodstock and from 1 to 10 in the offspring. The average observed and expected heterozygosities were 0.620 and 0.623 in the broodstock and 0.600 and 0.513 in the offspring, respectively. The possibility of a recent genetic bottleneck was suggested in both populations of *E. bruneus*. The minor, but significant, genetic differentiation ($F_{ST} = 0.047$, $P < 0.05$) observed was mainly due to statistically significant reductions in the number of alleles in the offspring compared with the broodstock, suggesting that these genetic changes could be related to genetic drift. Our results demonstrate the usefulness of microsatellite markers to monitor genetic variation and raise concerns about potential harmful genetic effects of inappropriate hatchery procedures. Therefore, genetic variation between broodstock and offspring in a hatchery should be monitored in both breeding and release programs as a routine hatchery operation, and inbreeding should ideally be controlled to improve kelp grouper hatchery management. Our data provide a useful genetic basis for future planning of sustainable culture and management of *E. bruneus* in fisheries.

Key words: Korean kelp grouper; Longtooth grouper; Genetic variability; Microsatellite loci; Artificial reproduction