Genetic relationships of Pacific abalone (Haliotidae) species determined using universal rice primer-polymerase chain reaction fingerprinting

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ABSTRACT. Random amplified polymorphic DNA (RAPD) with universal rice primers (URP) was used to identify species and to determine phylogenetic relationships for the 6 economically important Korean Pacific abalone species: Haliotis discus hannai, H. discus discus, H. madaka, H. gigantea, H. diversicolor supertexta, and H. diversicolor diversicolor, whose morphological differentiation is difficult. Of the 12 URPs used in this study, 7 were effective in producing reproducible RAPD markers for these 6 species. Amplifications with the 7 URP primers yielded 129 reproducible amplified fragments ranging between 100 and 6000 bp in length. The dendrogram generated by the unweighted pair-group method using arithmetic averages showed that the 6 species were divided into 4 groups at 0.44 similarity level, indicating that they were genetically distant from each other and had little internal phylogenetic resolution. One group included H. discus hannai, H. discus discus, H. madaka, and H. gigantea, which were divided into 2 groups at 0.52 similarity level: one group of H. discus hannai, H. discus discus, and H. diversicolor diversicolor.
and the other of *H. gigantea*, *H. diversicolor supertexta* and *H. diversicolor diversicolor* belonged to the other group. Furthermore, the reproducible pattern of amplified DNA bands by URP primers indicated the possibility of using these as molecular markers for the discrimination of the 6 Pacific abalone species. These results suggest that the URP-PCR approach will be a useful tool for obtaining accurate taxonomic identification and genetic relationship of Korean Pacific abalones, which is one of the first prerequisites in effective conservation programs.

**Key words:** URP primer; Genetic relationship; Korean Pacific abalone; Random amplified polymorphic DNA (RAPD); Molecular marker