Abstract

This study is to identify AFLP marker related to low-salinity tolerance in the black tiger shrimp. In the experiment, postlarval 15 (PL-15) from ten full-sib families were initially acclimatized in 30 ppt seawater for 14 days then suddenly transferred to the diluted seawater of 3 ppt and reared for 30 days. Survival and dead shrimps were collected individually. The shrimp samples were categorized into 3 groups: Group 1 were shrimps that died within 1 day, Group 2 were shrimps that died within 2-7 days and Group 3 were shrimps that could survive after 30 days. Genomic DNA from each family was extracted from individual shrimp samples and pooled within their group. The pooled DNA samples were then analyzed by AFLP technique with 45 primer combinations. The results showed that 32 polymorphic bands were generated from 18 primer combinations. Twenty-seven of all polymorphic bands were successfully cloned and sequenced. A total of 17 polymorphic loci of AFLP markers were converted to SCAR markers. These seventeen specific primers were designed and screened with the genomic DNA of the shrimps died within 1 day and the survived shrimps. The Pm15-2 primer showed polymorphism between the shrimps in Group 1 and Group 3 with 64.4% phenotype prediction (P≤0.01). The other three monomorphic primers (Pm6, Pm16-1 and Pm38) were further developed using SSCP analysis and were successfully used to distinguish the shrimps in Group 1 and Group 3 (P≤0.01). This study has demonstrated that the SCAR markers, Pm15-2, Pm6, Pm16-1 and Pm38 are potentially used as the marker-assisted selection for low-salinity tolerance in P. monodon breeding program.