عنوان مقاله:

Genomic selective breeding as a booster of aquaculture productivity

محل انتشار:

ششمین کنگره بین المللی تحقیقات شیلات و آبزیان (سال: 1401)

تعداد صفحات اصل مقاله: 1

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خلاصه مقاله:

Genomic selection (GS) is being considered as a promising and state of the art approach exploiting molecular genetic markers to design novel breeding programs and to develop new markers-based models for genetic assessments. In aquaculture selective breeding programs, the GS provides the opportunities to favour genetic gain of complex traits per time and cost. The cost-benefit balance was an important consideration for GS to work in fish species. Availability of genome-wide high-throughput due to NGS, cost-effective and flexible markers, low ascertainment bias, suitability for large population size and effectiveness in both model and non-model fish species with or without the reference genome are of the most important features for the successful and effective implementation in aquaculture activities. These factors were the major limitations to previous marker systems such as SSRs, while today due to advances in genome sequencing technologies known as NGS, novel SNP genotyping platforms especially the genotyping by sequencing are available. The new marker technology has indeed made an evolution to the field of biology and due to the simultaneous marker discovery and genotyping; the use of GS has become true to boost the genetic gain over generations of selective breeding. It is proved that conducting GS programs increases the accuracy of predicted genomic-estimated breeding values while keeping genetic diversity and avoids inbreeding by optimizing the effective population size. Genome-wide association study is considered as the first step of conducting a GS program which enables discovery of the markers significantly associated to the traits on interest. In order to make the most use of GS, combining GWAS with high-throughput phenotyping for achieving the valuable genetic gain from complex traits is highly advised.

کلمات کلیدی:

GBS, GWAS, Quantitative trait loci, Selective breeding, SNP

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