



DNA Testing for Aquaculture and Fisheries Management

Applications:

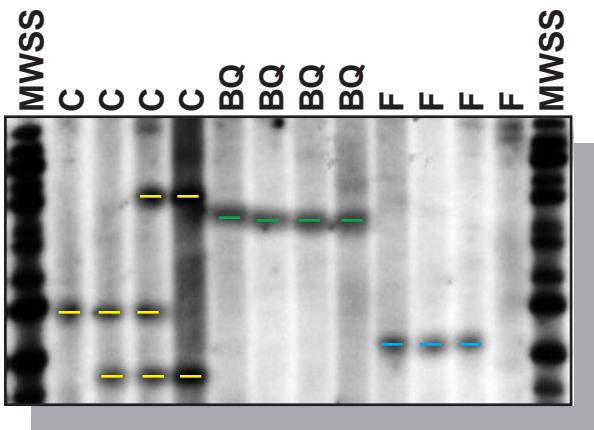
- Stock/Strain Identification
- Hybrid Differentiation
- Estimation of Genetic Variation
- Screening for Markers for Production Traits or Genetic Disorders
- Individual Identification

The DNA testing services offered by Therion International have dramatically enhanced the ability to answer questions of identity in aquatic animals. DNA-based tests are more powerful than conventional blood protein and isoenzyme analysis because they detect highly variable DNA sequence information. Aquaculturists and fisheries scientists can further refine their production and management efforts through the acquisition of data concerning genetic identity/variation at the individual, stock or species level.

Depicted on this fact sheet are examples of results produced from several studies concerned with the genetics of aquatic animals.

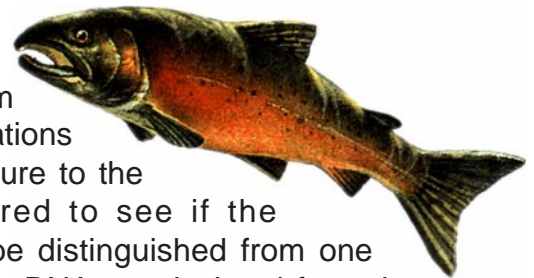
Stock Identification

•Coho Salmon



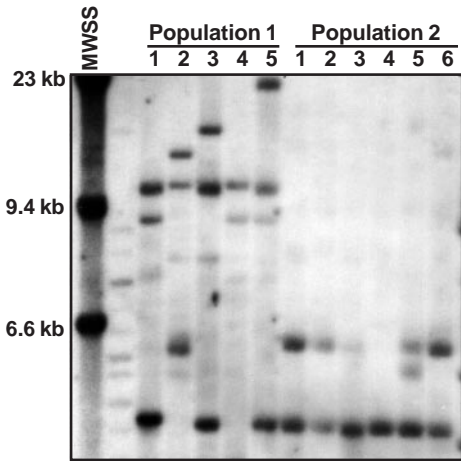
The DNA profiles of four individuals from each of three populations of coho salmon (figure to the left) were compared to see if the populations could be distinguished from one another genetically. DNA was isolated from the blood of each individual and cleaved with the restriction enzyme Hinf I. These fragments were then separated on a 1% agarose gel and transferred to a nylon membrane. The membrane was hybridized with Therion's proprietary DNA probe, OPT™-06, washed and exposed to x-ray film.

The lanes labelled MWSS contain molecular weight sizing standards. Three genetic markers (yellow bands) were observed in 50-75% of "C" individuals tested, but were not observed in any "BQ" or "F" salmon. One genetic marker (green bands) was found to occur in all "BQ" coho but not in any of the other coho populations. In addition, 75% of "F" coho salmon exhibited a specific genetic marker (blue bands) which did not appear in any individuals from the "C" or "BQ" population. In conclusion, Therion's DNA testing services make it possible to readily differentiate among these stock populations.



Stock Identification

•Striped Bass



A study was conducted to identify genetic markers that could differentiate among individuals representing two populations of striped bass. The figure to the left shows the DNA profiles of 11 striped bass generated with probe/enzyme combination OPT™-05/Hae III. All individuals from Population 1 display bands in the region above 6.6 kb. None of the individuals from Population 2 have bands in this area, thus the two populations can be genetically distinguished by the presence or absence of bands in the region above 6.6 kb.



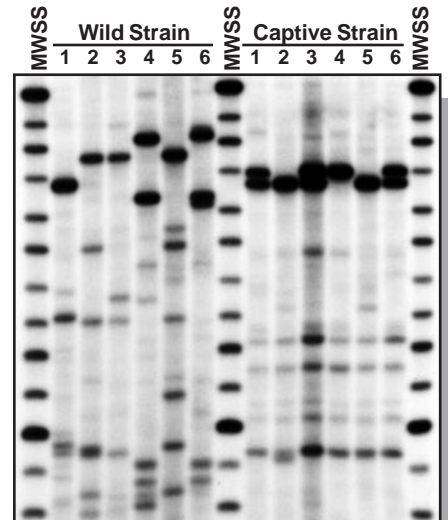
Striped Bass

Genetic Variation

•Shrimp



A client was concerned about the potential loss of genetic variation within a captive strain of *Penaeus stylirostris*. The figure to the right compares the DNA profiles of six shrimp from a captive population to six shrimp from a wild population. These profiles were generated with the probe/enzyme combination OPT™-05/BstN I. Within the captive strain, genetic variation is less than 15%; note that each genetic marker is shared by nearly all individuals. The wild strain shows significantly more genetic variation than the captive population. Therion was able to estimate the level of genetic variation using its proprietary computer softwares which analyze and quantify DNA profile banding patterns. From these data, genetic parameters such as indices of bandsharing, heterozygosity and genetic distance can be derived to estimate genetic variation and relatedness.



Specimen Requirements

(Please call before shipping **any** samples)

Specimen Type		Volume	Container	Shipping Instructions
Whole Blood		1 - 2 ml	EDTA purple top Vacutainer™	Liquid - overnight on ice packs Frozen - overnight on dry ice
Tissue	fish (suggest fin clips)	1 - 2 sq. cm	Secure tube/vial with 70% ethanol	Overnight or second day
	other species			
Call for instructions				

William F. Gergits
 Managing Member
 Marketing and Business Development

Nancy J. Casna, Ph. D.
 Managing Member
 Laboratory and Operations

