The development of tools for tracing and evaluating the genetic impact of fish from aquaculture: “AquaTrace”

From 2012-11-01 to 2016-10-31, closed project

Project details

<table>
<thead>
<tr>
<th>Total cost:</th>
<th>Topic(s):</th>
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<tbody>
<tr>
<td>EUR 3 927 338</td>
<td>KBBE.2012.1.2-12 - Providing molecular tools for assessing and monitoring the</td>
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<tr>
<td></td>
<td>potential genetic impact of aquaculture on native populations (The Ocean of</td>
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<tr>
<td></td>
<td>Tomorrow)</td>
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<tr>
<th>EU contribution:</th>
<th>Call for proposal:</th>
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<tbody>
<tr>
<td>EUR 2 999 184,60</td>
<td>FP7-KBBE-2012-6-singlestage See other projects for this call</td>
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<tr>
<th>Coordinated in:</th>
<th>Funding scheme:</th>
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<tbody>
<tr>
<td>Denmark</td>
<td>CP-TP - Collaborative Project targeted to a special group (such as SMEs)</td>
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Objective

The genetic changes associated with domestication in aquaculture pose an increasing threat to the integrity of native fish gene pools. Consequently, there is a burgeoning need for the development of molecular tools to assess and monitor the genetic impact of escaped or released farmed fish. In addition, exploration of basic links between genetic differences among farmed and wild fish and differences in important life-history traits with fitness consequences are crucial prerequisites for designing biologically informed management strategies. The project “AquaTrace” will establish an overview of current knowledge on aquaculture breeding, genomic resources and previous research projects for the marine species seabass, seabream and turbot. The project will apply cutting-edge genomic methods for the development of high-powered, cost-efficient, forensically validated and transferable DNA based tools for identifying and tracing the impact of farmed fish in the wild. Controlled experiments with wild and farmed fish and their hybrids will be conducted with salmon and brown trout as model organisms using advanced “common garden” facilities. These experiments will elucidate the fundamental consequences of introgression by pinpointing and assessing the effects on fitness of specific genomic regions. Generated insights will form the basis of a risk assessment and management recommendations including suggestions for mitigation and associated costs. This information and the developed molecular tools will be available as open-access support to project participants and external stakeholders including the aquaculture industry. The project is expected to facilitate technology transfer to the aquaculture sector by promoting better tailored breeding practices and traceability throughout production chain. Overall this initiative will support the development of sustainable European aquaculture and provide “Good Environmental Status” in line with the Marine Strategy Framework Directive.

Related information

<table>
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<tr>
<th>Result In Brief</th>
<th>Traceability tools for cutting edge aquaculture</th>
</tr>
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<tbody>
<tr>
<td>Report Summaries</td>
<td>Exploitable results – Aquatrace video</td>
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<tr>
<td></td>
<td>Exploitable results – Bioinformatic pipeline for ddRAD (Double Digest RAD sequencing).</td>
</tr>
</tbody>
</table>
Exploitable results - Documented trait (growth) differences among wild, farmed and introgressed salmon, kept at different temperatures

Exploitable results - Genomic sequences and genome assembly for seabass and seabream

Exploitable results - Review of assignment methods and software in traceability / aquaculture

Exploitable results - SNPs identified from ddRAD sequencing - genetic variation identified - for populations of turbot, European seabass and gilt-head (sea) bream

Exploitable results - Salmon and trout families (including extracted DNA and RNA) for analysing trait differences among farmed, introgressed and wild fish

Exploitable results - Sample collection of wild and farmed Seabass, Seabream and turbot covering both Atlantic and Mediterranean populations and farms

Exploitable results - Survey on selective breeding programs implemented in the European aquaculture industry

Exploitable results - Web based presentations of species leaflets for seabass, seabream, turbot, Atlantic salmon and brown trout, including available biological information such as life-history traits, genetic and genomic characteristics, ecological, conservation, fisheries and aquaculture specific issues

Final Report Summary - AQUATRACE (The development of tools for tracing and evaluating the genetic impact of fish from aquaculture: “AquaTrace”)

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- Spain: EUR 229 300
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Subjects
Scientific Research

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