

Risks involved with transgenic fish

August 31 2009



This is a transgeneic fish. Credit: University of Gothenburg

Fast growing transgenic fish can revolutionise commercial fish farming and relieve the pressure on overexploited fish stocks. But what happens in the natural environment if transgenic fish escape?

Researchers at the University of Gothenburg have studied transgenic fish on behalf of the EU and are urging caution:

"Until further notice transgenic fish should be bred in closed systems on land," says Fredrik Sundström at the Department of Zoology, University of Gothenburg.

By furnishing fish with genes from other organisms, so-called transgenes, researchers have succeeded in producing fish that grow considerably faster or are more resistant to diseases. Fish can also be modified to cope better with cold, which facilitates breeding in colder conditions. There are major benefits for commercial [fish farming](#) as transgenic fish are expected to deliver higher production and better

yields. However, transgenic fish can also entail risks and undesirable effects on the natural environment.

Transgenic fish are created by transferring genes to fish from other species, including human beings. The gene selected is propagated using bacteria and then isolated, purified and introduced into the eggs of the host fish by microinjection. The genes transferred contain a DNA sequence with codes for the required characteristic. Hitherto researchers have genetically modified some twenty fish species, including [carp](#), salmon and catfish.

More resistant to toxins

For example, transgenic fish can be more resistant to environmental toxins, which could entail the accumulation of toxins that ultimately end up in consumers. There are also misgivings that the higher level of growth hormone in the fish can affect people. Researchers at the University of Gothenburg have therefore been commissioned by the EU to study the environmental effects of GMO (genetically modified organisms) within fish farming. The results of the studies show that the genetically modified fish should be treated with great care.

Fredrik Sundström, PhD at the Department of Zoology, has studied transgenic salmon and rainbow trout to ascertain what ecological risks they might constitute for the natural environment. The study, which simulated escapes in a laboratory environment, shows that transgenic fish have a considerably greater effect on the natural environment than hatchery-reared non-transgenic fish when they escape. For example, genetically modified fish survive better when there is a shortage of food, and benefit more than non-transgenic fish from increasing water temperatures.

"It is probably due to the fact that genetically modified fish have a

greater ability to compete and are better at converting food," says Fredrik Sundström.

Natural breeds are under threat

If transgenic fish become established in natural stocks they would be able to outcompete the natural breeds. However, conducting studies in a laboratory environment that imitates nature is complicated, which makes it difficult to predict how escaped transgenic fish affect the natural environment. Fredrik Sundström's conclusion is that international consensus is required before commercial farming can be permitted, and that a precautionary principle must be applied.

"One option is to farm the transgenic fish on land, which would make escape impossible. At least fertile fish should be kept in a closed system," says Fredrik Sundström.

As of yet no country has permitted commercial farming of transgenic fish, but several applications for such operations are under consideration by authorities in both the USA and the EU.

Source: University of Gothenburg ([news](#) : [web](#))

Citation: Risks involved with transgenic fish (2009, August 31) retrieved 27 April 2024 from <https://phys.org/news/2009-08-involved-transgenic-fish.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.