

## Virus-resistant tilapia could help safeguard critical food source, preserve \$10 billion fishing industry

Resistance to a deadly disease that is affecting the second most farmed fish in the world has been found to be mainly due to differences in genes between families of the same fish.

The breakthrough could help protect stocks of Tilapia fish, which is an important food source in Africa, Asia and South America and worth nearly \$10 billion to the global economy.

Since its detection in 2014, Tilapia Lake Virus (TiLV) has ravaged Tilapia populations in 16 countries across three continents.

Clinical signs of the virus observed in tilapia include behavioral changes, discoloration, skin hemorrhages, loss of scales, eyeball protrusion and abdominal swelling. There are currently no treatments or vaccines for TiLV.

Experts believe that selective breeding of fish with the resistance genes may be one way of limiting the damage of this disease, with up to 90 per cent of fish dying once infected.

Researchers from University of Edinburgh's Roslin Institute and WorldFish [analyzed the genes](#) of 1,821 Genetically Improved Farmed Tilapia (GIFT), which were tagged and placed in a pond that had an outbreak of TiLV.

The fish used in this experiment were members of 124 families, and the team discovered that there was a large variation in family survival. Some family groups had no deaths, whereas others found to have a 100 per cent death rate.

The team then used statistical models to show that resistance to the virus was very heritable, and this means that selective breeding to produce more resistant tilapia strains is likely to be effective.

The variation in TiLV resistance were found to be independent of genetic variation in growth, meaning that any future breeding programs for GIFT that produce fish resistant to TiLV will not adversely affect the growth of the fish, and will benefit farmers' yields.

The GIFT strain was selectively bred to be fast growing and adaptable to a wide range of environments. The strain is produced in at least 14 countries, helping to reduce poverty and hunger.

Tilapia is an affordable food source for many people, particularly in developing countries. It is the fourth most consumed fish in the United States.

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