United States Department of Agriculture

Emerging Risk to Animal Health Notice
Tilapia Lake Virus (TiLV)

June 13, 2019

Key Points

- This is the first United States (U.S.) detection of TiLV.
- TiLV is an orthomyxo-like RNA virus which affects farmed and wild Tilapia.[1]
- TiLV was previously confirmed in several regions of the world including Africa, Asia, and Central and South America.
- The mortality rate associated with TiLV ranges between 10 – 90 percent.[2]
- TiLV is not known to pose a human health risk.

Concerns for U.S. Animal Health

- No reported studies of survivability of TiLV in water or on equipment have been conducted. Tilapia fillets stored at the commercial freezing temperature were found to be a low risk for spreading the virus.[9]
- Proper aquaculture biosecurity practices are recommended to prevent introduction and spread.
- The consequences of TiLV introduction and spread in the United States could be substantial for the industry. In 2013, the total value of Tilapia produced in the United States was about $42,527,000 or about six percent of all aquaculture production and was produced on 181 farms.[10]
- TiLV is not known to be a threat to other fish species.

Epidemiology

TiLV was first described in association with outbreaks of fish mortality in Israel and Ecuador in 2009[1] and has been associated with high mortality events among naïve *Tilapia* (genus), farmed fish belonging to the family Cichlidae.[3]

Signs of TiLV in Israel's 2009 outbreak included: black discoloration, skin abrasions, ocular degeneration, renal congestion and encephalitis. Clinical signs in reports from other countries include loss of appetite, abdominal swelling, exopthalmia, scale protrusion and pallor.

Lesions are predominately associated with the kidney, liver, brain and gastro-intestinal tract.[1, 5]

Studies suggest that tilapia may develop a protective immune response, as they appear to be immune to subsequent TiLV infections if they survive the initial infection.[4]

Direct horizontal transmission is an important route of transmission. The characteristics of the virus are not well understood, and it is difficult to determine the importance of indirect transmission through fomites. [6] TiLV has been called "tilapia one month mortality syndrome" as it is reported within one month after fry or juveniles are moved from hatcheries to grow-out cages.[7]

Diagnostic Testing

Diagnostic testing includes PCR, virus isolation in cell culture, and sequencing.

Appropriate tissues to collect include liver, heart, kidney, spleen, and brain. While there is no validated screening or diagnostic assay, TiLV testing is being conducted in the United States by several laboratories and by the National Veterinary Services Laboratories.

Treatment

There is currently no treatment or vaccine.

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Mitigation Options

Good aquaculture biosecurity practices and husbandry are recommended to prevent disease introduction and spread. These practices include:

- purchase of live fish and germplasm from sources known to be negative for the virus,
- quarantining and monitoring all new fish stocks upon arrival to a farm,
- disinfecting and properly disposing of water used to transport live fish, and
- noting any unusual rise in mortality followed by appropriate diagnostic testing.

An additional recommendation is routine disinfection of equipment with appropriate disinfectants.[8]

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