

# Aquareovirus

## I. Causative Agent and Disease

*Aquareovirus* is a genus in the virus family Reoviridae. These icosahedral (60-80 nm) 11 segmented double-stranded RNA viruses (over 50) have been isolated from a variety of marine and freshwater aquatic animals worldwide including finfish, and bivalve molluscs. Genetic analyses have identified 7 different genotypes or species (A-G) of aquareoviruses. Most of these viruses produce self-limiting infections of low pathogenicity and are not associated with extensive disease or mortality. Exceptions include isolates from 7 fish species that have been associated with fish mortality, most notably the grass carp aquareovirus (G). The viral agents are most often isolated from asymptomatic adult carrier fish during routine screening examinations.

## II. Host Species

In the Pacific Northwest states of Washington, Oregon and California, adult Chinook salmon appear to be the most frequent species infected with aquareovirus A or B. The virus has also been isolated from adult coho and chum salmon and steelhead. Rainbow trout have been experimentally infected with the virus resulting in mild hepatitis with no overt disease or mortality. In Alaska, aquareoviruses have been isolated from Chinook salmon (species B) and geoduck clams (species A).

## III. Clinical Signs

Fish naturally infected with aquareoviruses generally do not exhibit clinical signs of disease. Experimental infections can produce focal necrotic lesions in the livers of rainbow trout, chum salmon and bluegill fry. Other pathogenic exceptions include the grass carp species G that is

associated with epizootic fish mortality producing severe hemorrhaging in fingerlings and yearlings resulting in up to 80% mortality.

## IV. Transmission

Transmission is horizontal via water or from fish to fish. Isolates from bivalve mollusks likely represent virus that has been shed into the water column from a fish host and then bioaccumulated into shellfish tissues by filter feeding.

## V. Diagnosis

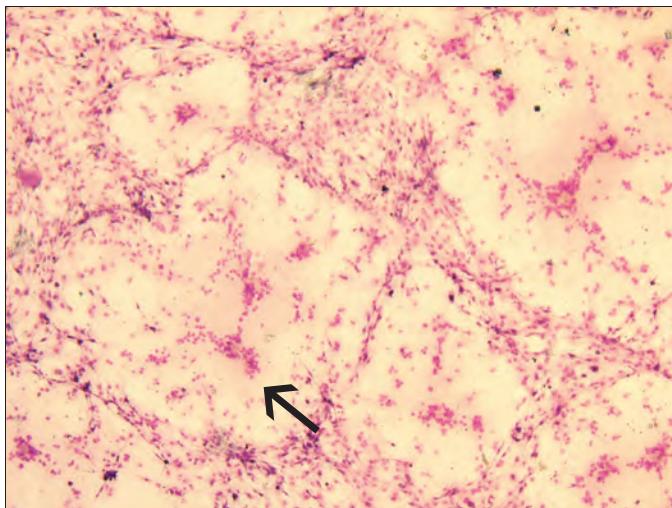
Detection of *Aquareovirus* is by isolation of the virus in cultures of susceptible fish cell lines inoculated with infected tissue. The virus causes a unique cytopathic effect (CPE) characterized by focal areas of cellular fusion (syncytia) and cytoplasmic destruction creating a vacuolated or foamy appearance. The exception is grass carp species G that produces a diffuse CPE. Presumptive identifications are made based on the typical CPE and are confirmed by serology, electron microscopy or polymerase chain reaction (PCR).

## VI. Prognosis for Host

The prognosis for the fish host is good in the majority of cases where the virus is not a primary pathogen. There are no corrective therapies for viral infections in fish except avoidance.

## VII. Human Health Significance

There are no human health concerns associated with aquareoviruses.



Large rounded plaques of syncytial cell CPE (arrow) of *Aquareovirus* in bluegill fry cells.



Double capsid morphology of *Aquareovirus* particles (arrow) in negative stain; transmission electron microscopy, X 91,000.