Herpesvirus anguillae (HVA)

and other viruses of European eels

Herpesvirus anguillae (HVA) was first detected in the summer of 2009 following investigations of an eel specific mortality by staff at the National Fisheries Laboratory, Brampton. This was the first confirmed outbreak of HVA in wild eels in the UK. The virus has since been confirmed at three other still water fisheries in England following large scale losses of eels. Efforts are underway to improve understanding of this virus, as well as other important viral diseases of European eels.

What is Herpesvirus anguillae (HVA)?

As the name suggests, Herpesvirus anguillae is a herpes virus that infects eels. This includes adult and juvenile stages of the European eel (Anguilla anguilla), Japanese eel (Anguilla japonica) and American eel (Anguilla rostrata). HVA is not known to infect any other fish species.

HVA is a warm water virus and is most active between 10^{o}C and 26^{o}C. Disease outbreaks have all been reported during summer and early autumn. Like other herpesviruses, disease is usually triggered by stress, which can include poor water quality, high stock levels and barriers to migration.

What does HVA actually do?

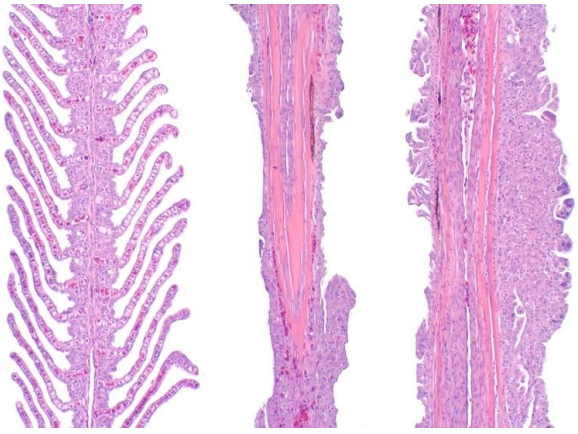
Eels infected with HVA can develop a range of disease signs and symptoms. Diseased eels may appear lethargic and swim near the surface or the water's edge. They may have reddened fins and a mottled appearance to the skin.

The main damage caused by this virus is to the gills, with necrosis (cell death) and loss of normal gill structure. The internal organs can also be affected with inflammation and further necrosis. These changes cause organ failure, leading to debilitation and death.

Gill necrosis (arrow) combined with fungal infections and loss of filaments are typical signs of HVA disease.

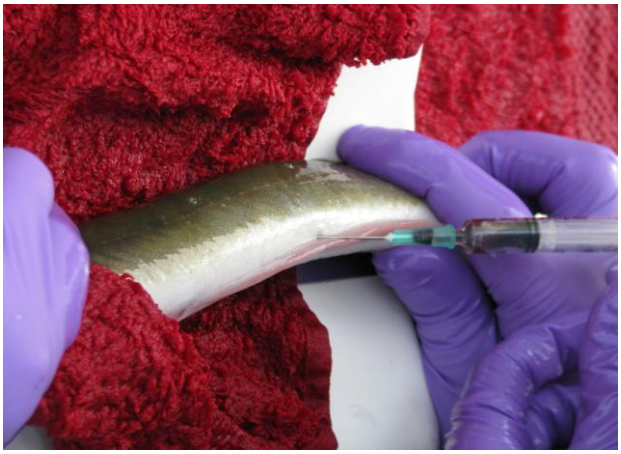
Is HVA widespread?

Little is known about the distribution of HVA in the UK. So far, the four mortality incidents recorded in England are the only confirmed cases of this disease in the wild. It is thought that the virus may be widespread in Europe and it is feasible that large numbers of eels carry the virus without developing disease problems. In some European fish farms young eels may be purposely exposed to the virus to promote resistance in the surviving fish. However, these outwardly healthy eels can potentially retain and shed the virus when stocked in to wider environments.



Histopathology of normal gill (left) and HVA infected gills (middle and right) showing severe damage and complete loss of normal gill structure.

A survey, in partnership with scientists at Cefas, is underway to establish the distribution of HVA in England and Wales. This involves taking blood samples from live wild eels captured during our eel monitoring surveys. All fish are returned alive to their rivers and the blood samples are used to detect antibodies to the virus. This information will tell us how widespread the virus is, what proportion of eels are affected and which river catchments are most at risk. This will inform future management decisions and will also support wider health initiatives like the European Eel Quality Database.



Blood sampling underway to confirm the distribution of HVA and other eel viruses in England and Wales.

Knowing the distribution of viruses will help inform eel management and help minimise future disease risks.

What about other viruses of eels?

There are three main viruses that pose a threat to European eels. These are HVA, Eel Virus European (EVE) and Eel Virus European X (EVEX). So far only HVA has been recorded causing disease in our wild eels. These viruses are known to cause mortality, reduce swimming performance and may prevent eels from reaching their spawning grounds in the Sargasso Sea. Work is underway to develop the necessary diagnostic tools to detect all three viruses in our eel stocks. This will be the first time such comprehensive surveys have been conducted, and will tell us a lot about the status of these diseases in the wild.

Why should viruses affect eel management?

Health is critical to the successful management of any fish species. Disease has the potential to undermine many eel management measures. For example, the effective stocking of elvers requires knowledge of disease risks to minimise the spread of pathogens and to promote survival of the fish being stocked. Disease is also an important component of eel spawner quality, potentially limiting the survival and reproductive success of eels leaving our rivers. Knowing the distribution of viruses like HVA, will allow the observed mortality events to be placed in to context. It will also allow us to confirm whether these viruses are common and widespread, or restricted to particular rivers or catchments. It is hoped that these studies will help raise awareness, reduce disease outbreaks and provide the information needed to support effective eel management practices.

If you experience fish mortalities, or require more information about fish diseases please contact:
National Fisheries Services, Environment Agency, Bromholme Lane, Brampton, Huntingdon, PE28 4NE. Tel: 01480 483802; Email:fish.health@environment-agency.gov.uk